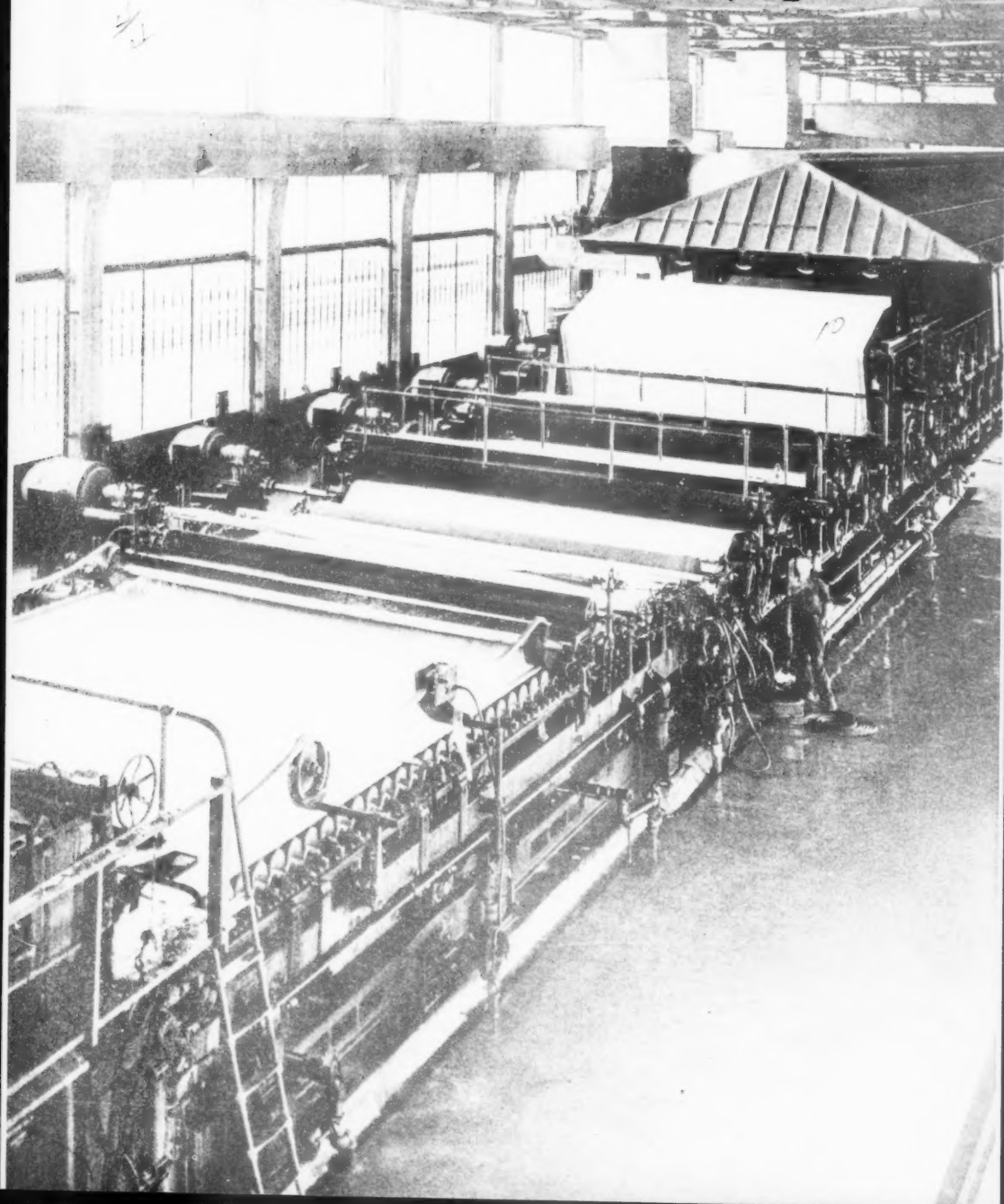


30  
REVIEW  
NUMBER

# PACIFIC PULP & PAPER INDUSTRY

#52



# WEBSTER-BRINKLEY SERVICE

Embraces the Design  
and Manufacture of  
Conveying, Screening  
Elevating and Transmission  
Machinery for Pulp and  
Paper Mills

*THE Leahy* Vibrating Screen

is Well Known for Its Efficiency  
in Screening Wood Chips



## WEBSTER-BRINKLEY CO.

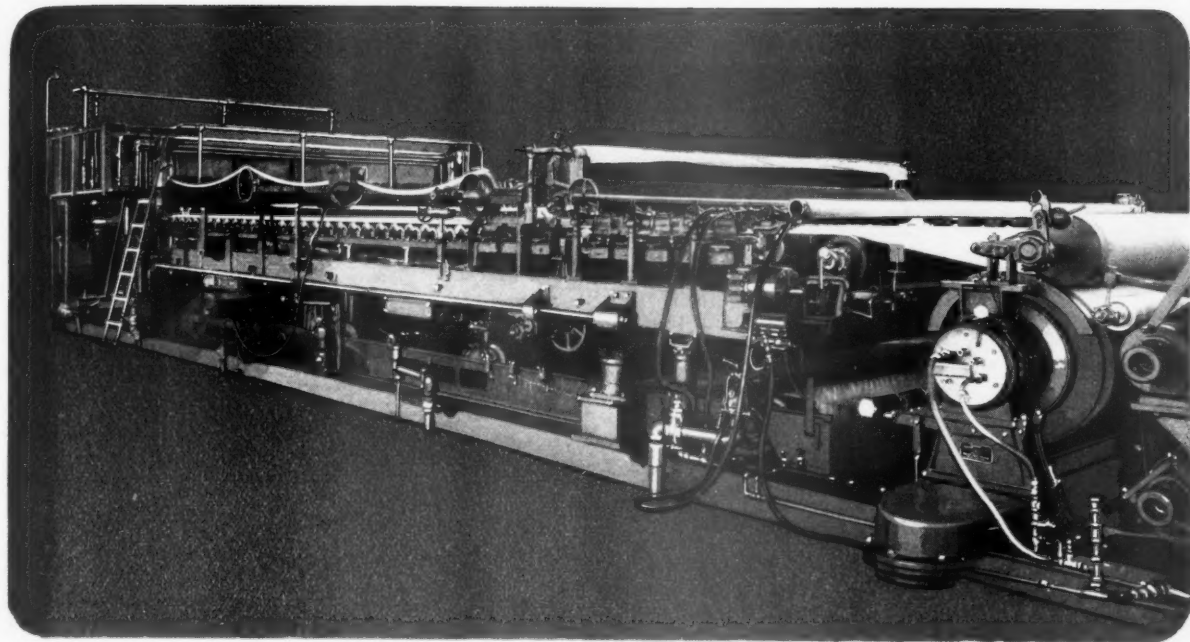
SEATTLE, WASHINGTON

*Manufacturers and Engineers of Conveying, Screening, Elevating and Transmission Machinery*









# The **REMOVABLE WAY** *is the* **MODERN WAY**

## A MOVIE IN SIX ACTS

**E**VERY paper mill executive, superintendent and worker who is not already acquainted with the modern method of making quick wire changes on the Fourdrinier, will read the following pages with interest.

The scenes shown are actual action-photographs, recently taken in the mill of the Hawley Pulp & Paper Co. in Oregon City, Oregon, where the Beloit Removable Fourdrinier (234-inch wire) is utilized in making news-print at about 1,000 feet per minute.

**BELOIT IRON WORKS • BELOIT, WIS., U.S.A.**

*The* **BELOIT**



1

## The Beloit Shuts Down

At 10:00 A. M. No. 4 machine, with 234-inch wire, 100 feet long, was shut down to make a wire change. The swinging rails or beams were then swung into position, and by pressing a button the entire Fourdrinier part was rolled out by power as a complete unit, free from the other mechanism of the machine.

2

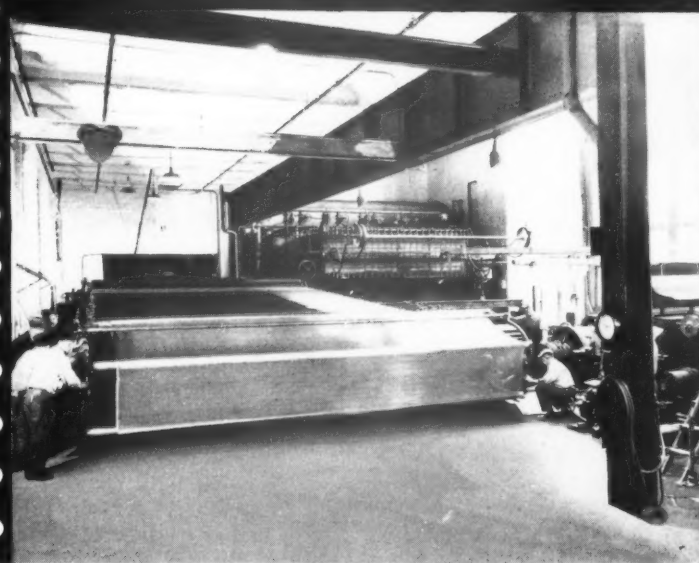
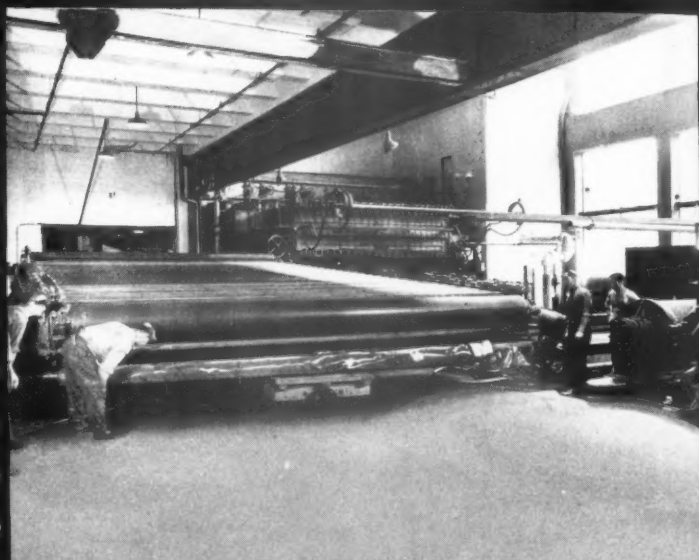
## The Beloit Rolls Out

At 10:25 A. M. the old wire had been removed and the Fourdrinier part was all ready to receive the new wire. You will note that through these few simple operations, no "cigarette holder" or crane was used, no rolls were carried, no bearings removed, no heavy lifting done. Expensive equipment was not endangered. Extra man-power was not required.

3

## The Wire Carriage Is Wheeled Up

Five minutes later, at 10:30 A. M., the patented Beloit wire carriage, with wire already draped into position thereon, was rolled up to the Fourdrinier. (Wherever the "Removable" is used, a "spare" wire is carried, just like the spare tire on your auto). This method prevents crimping or danger to the wire.



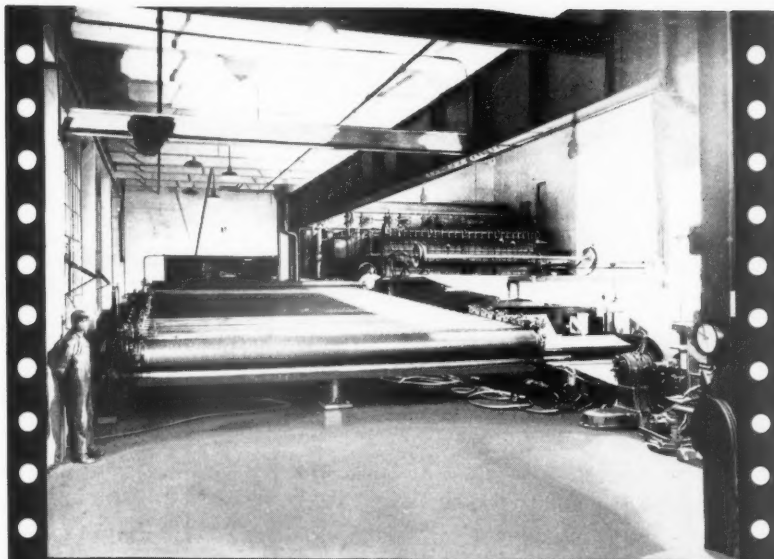
*The Removable makes any grade of paper—news, book, bond, kraft, board, tissue or specialties, on machines of any speed or width, as attested by over 88 outstanding installations from coast to coast*



4

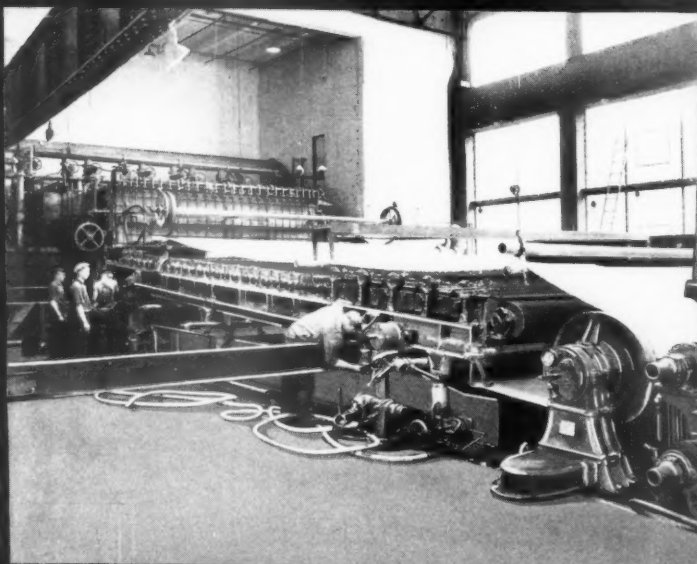
## New Wire Goes On

At 10:36 A. M. the new wire was draped into position. The use of the Beloit cantilever suction couch roll and patented wire carriage made this simple, without working inside the wire. (See page 4 for complete details). Then all that was required was to slide the Fourdrinier back into place—a quick, easy operation.



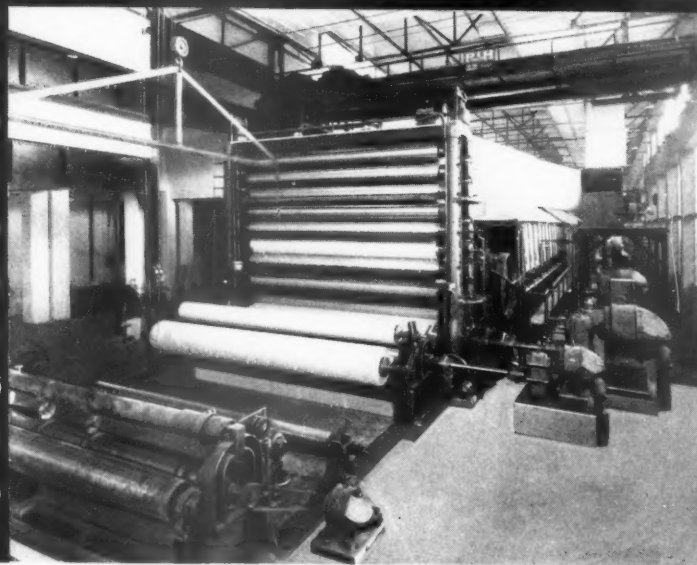
## Fourdrinier Rolls Back

At 10:53 A. M. the Fourdrinier is again back in its proper place, everything ready to run. This wire change is made with the regular operating crew, no extra men being required. No danger to wire, to machine, nor to the men. Everything in perfect alignment, as no parts had been removed. No time was lost in commencing operation.



## Making News-print Again

At 11:08 A. M. news-print was again being run through the calenders. The entire operation, from shut-down to finished paper, required only 1 hour and 8 minutes. Some of the operations, for the convenience of the photographer, were slowed up. Wire changes in this mill, and many others, have often been made in less than an hour.



*Beloit engineers are ever ready to figure with you on your problems. Correspondence invited from mill executives.*

# Plan Ahead— Look toward the Future



**W**HEN you buy a new suction couch roll, insist upon a Beloit Cantilever (Patented), even for an old non-Removable Fourdrinier. You will then be ready for the new removable which you will eventually buy. The Beloit Cantilever, with proper care, will last indefinitely, as there is practically no wear.

The Cantilever Suction Couch Roll is exclusively a Beloit patent.

**T**HE combination of the Beloit patented cantilever suction couch roll and the Beloit patented wire carriage makes it possible, even on non-removable or stationary type Fourdriniers, to get some of the time, labor and money-saving benefits for which the Removable Fourdrinier is now famous.

Note the patented Beloit wire carriage illustrated. The wire is carried on this carriage, always ready for instant use, just like the spare tire on your car. It is always draped in proper position; all that is necessary is to roll the carriage up to the Fourdrinier, and transfer the wire from the carriage to the Fourdrinier by a few simple, rapid operations. The wire is not handled or touched by the men.

The cantilever suction couch roll permits front end of roll to be suspended, when wire is being changed, thus doing away with the perilous use of "cigarette holder" or overhead crane. The danger of wrinkling or kinking the wire is eliminated. As all suction rolls are equipped with roller bearings, smoother operation is assured as

well as a considerable saving in power costs.

Here is a combination that saves considerable labor, time and money, and protects the expensive wire from the usual handling hazards. It simplifies the wire changing operation, and, in most mills, soon pays for itself in the savings it effects.

*Write for details as to how this better system can be applied to modernize your mill.*

**The Beloit Way is the Modern Way**

**BELOIT IRON WORKS, BELOIT, WISCONSIN, U. S. A.**

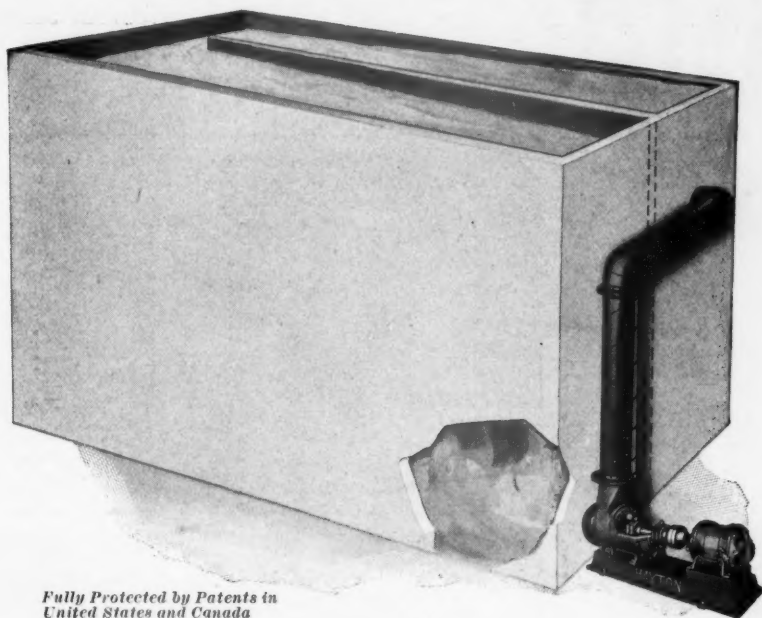
## The BELOIT











*Fully Protected by Patents in  
United States and Canada*

## Are You Satisfied With Your Stock Agitation? . . . . . If Not, Write Us

26 mills are now agitating stock of high density the HAYTON WAY. Over 80 agitator pumps installed, many of them repeat orders.

Our combination type Agitator and Centrifugal Pump enables a mill to agitate and at the same time transfer part of the stock without variation in quantity, both functions being accomplished with a minimum of power.

Have you received information concerning our Beater Circulator, which increases the capacity of beaters and saves power? Write us for information.

### CENTRIFUGAL and TRIPLEX PLUNGER PUMPS

**Hayton Pump & Blower Co.**  
Appleton, Wisc.

*When writing to HAYTON PUMP & BLOWER Co., please mention PACIFIC PULP AND PAPER INDUSTRY.*

# Standard motors



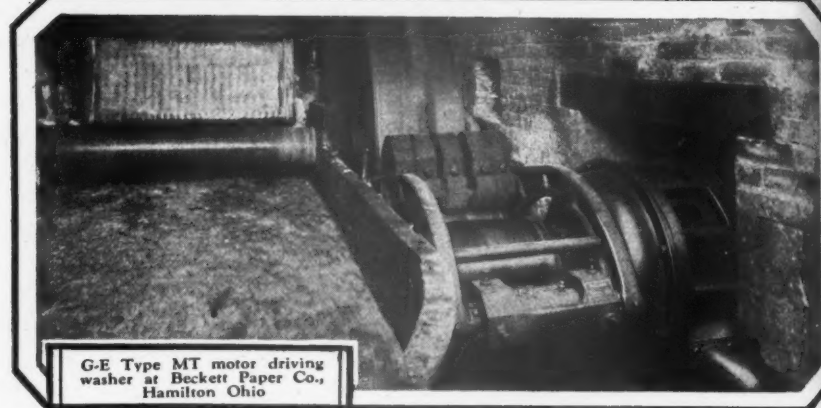
G-E Type KT motors driving tunnel drivers at Union Bag and Paper Power Corp., Tacoma, Wash



G-E Type CD motor driving high-speed cutter and layboy at Meade Pulp and Paper Co., Chillicothe, Ohio



G-E synchronous motors driving Jordans at A P W. Paper Co., Albany, N. Y.



G-E Type MT motor driving washer at Beckett Paper Co., Hamilton Ohio

Apply the proper G-E motor and the correct G-E controller to a specific task, following the recommendations of G-E specialists in electric drive, and you have G-E Motorized Power. Built in or otherwise connected to all types of industrial machines, G-E Motorized Power provides lasting assurance of performance that builds confidence.



**Motorized Power**  
-fitted to every need

# GENERAL

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

# for special jobs

**S**PECIAL jobs do not necessarily require special motors—most of them can be handled efficiently and economically by standard G-E general-purpose motors.

So extensive is the line of G-E general-purpose motors that they can be used for a large majority of the applications of any mill—driving Jordans, winders, barkers, cutters, dryers, conveyors, pumps, etc.

When special equipment is necessary, General Electric can furnish it.

But farsighted operators use G-E general-purpose motors wherever possible, not only because their standard design makes a lower cost, but because, like other General Electric motors, they have the electrical and mechanical properties which give reliable, economical operation.



G-E Type KT motors driving barkers and conveyors at Spalding Pulp and Paper Co., Newberg, Ore.

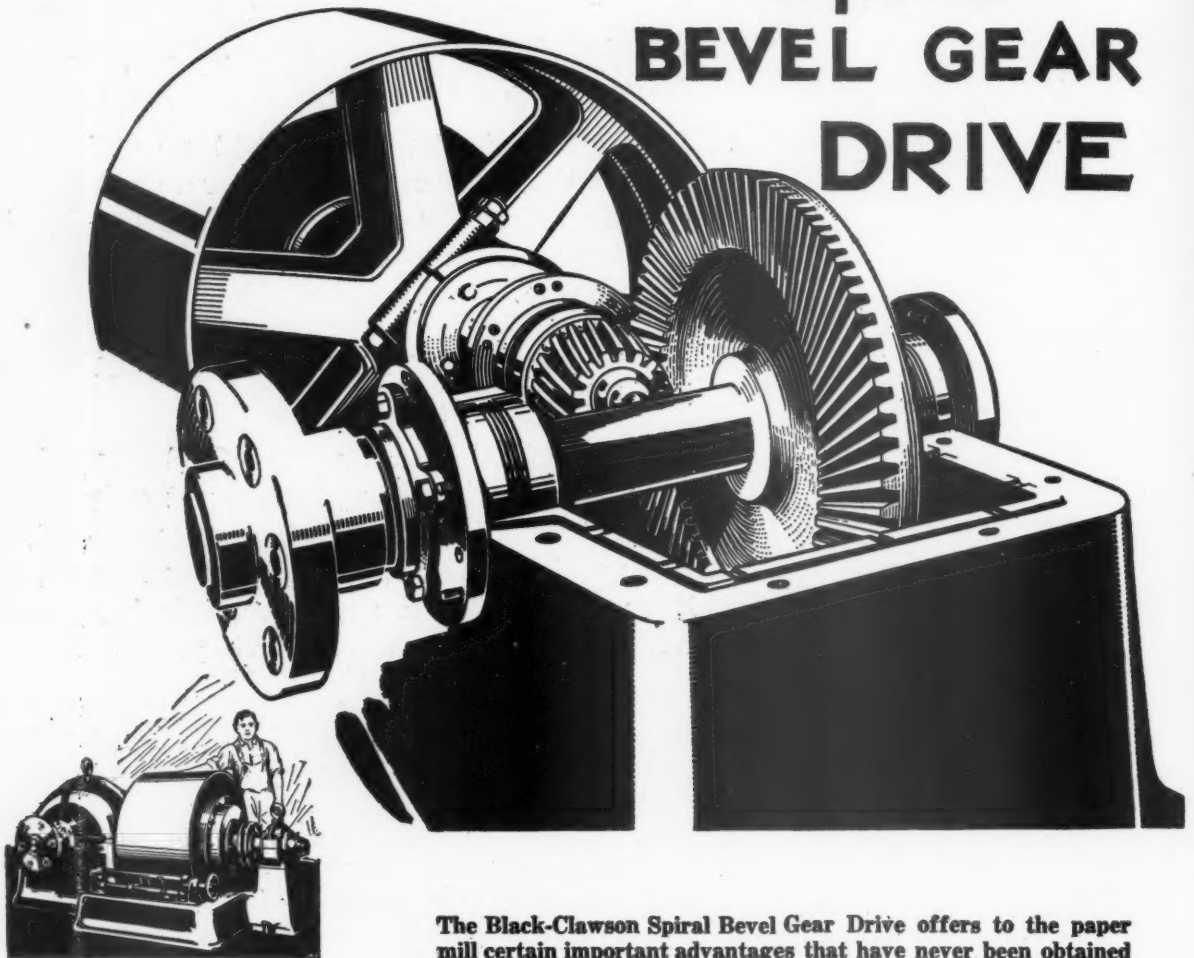


G-E motors driving centrifugal pumps handling black liquor used in Wagner furnace system at Union Bag and Paper Power Corp., Tacoma, Wash.

**E L E C T R I C**  
SALES OFFICES IN PRINCIPAL CITIES

# BLACK-CLAWSON

## Spiral BEVEL GEAR DRIVE



The Black-Clawson Spiral Bevel Gear Drive offers to the paper mill certain important advantages that have never been obtained in any other type drive. This is not a challenge, but a statement of fact.

This drive is practical for any type of paper machine—board machine at slow speeds, or on the fastest running Fourdrinier.

Your drives may be inadequate. If so, they can be replaced with this newer type at moderate cost and without interfering with production.

Have us point out the several outstanding features of superiority hinted at above—and show you just why the Black-Clawson drive is the logical one to use.

*Are you receiving the Messenger?*

**The Black-Clawson Co.**

HAMILTON, OHIO

*Established 1873*

Export Offices: 15 Park Row, New York City

*Builders of  
Highest Quality Pulp and Paper Mill Machinery*

*Patentees and Sole Builders of  
Vertical Dryers and Champion Fourdriniers*

# BLACK-CLAWSON

CHAMPION



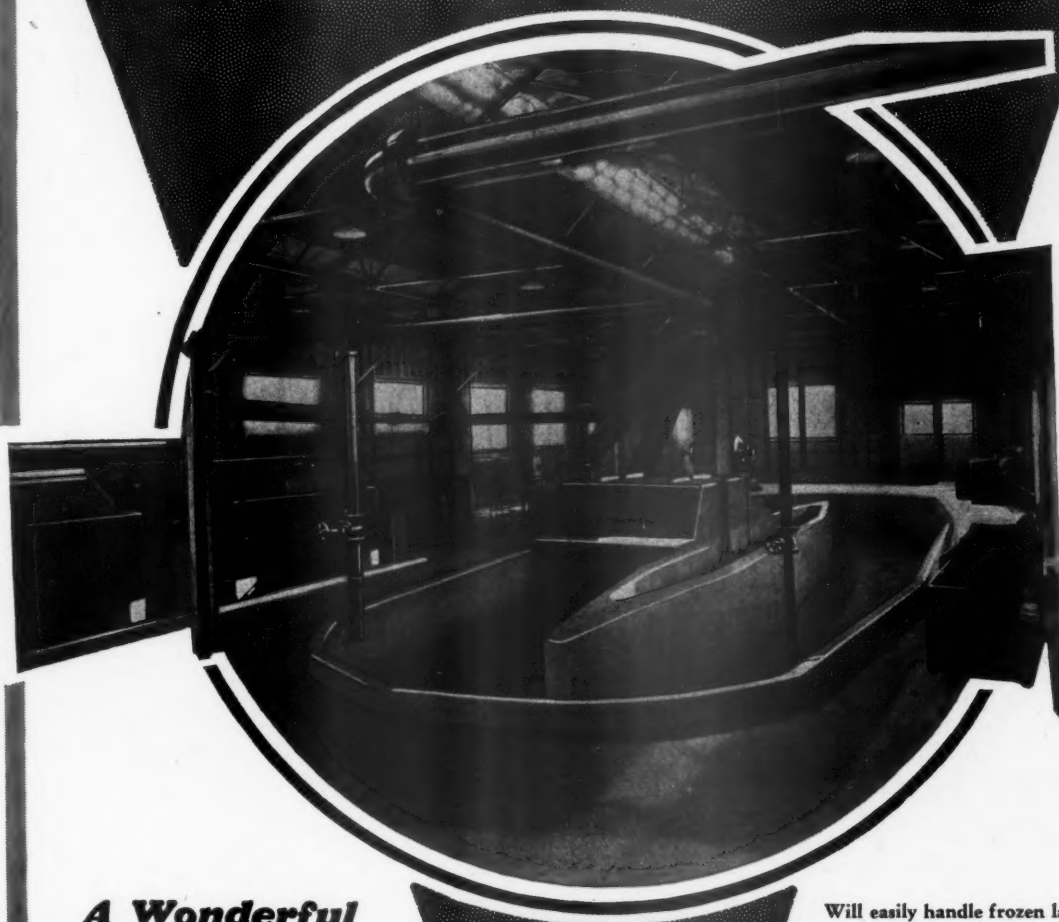
FOURDRINIERS

*Built with Machine-Tool Accuracy*

*When writing to BLACK-CLAWSON Co. please mention PACIFIC PULP & PAPER INDUSTRY*



# BREAKER BEATERS



## **A Wonderful Record —**

Draw your own conclusion after we tell you that the Shartle Breaker has replaced one or more breaker installations of all other well known makes, but that no competing make has ever permanently replaced a Shartle.

Will easily handle frozen lumps. Will do away with a shredder. Will reduce your pulp to a satisfactory consistency. **AND PAY FOR ITSELF OUT OF THE SAVINGS ON LABOR IT WILL BRING ABOUT.**

If you doubt, we're here to prove it to you. Are you ready to listen to the evidence?

# SHARTLE BROTHERS

DIVISION OF THE BLACK-CLAWSON COMPANY

Paper Mill



Machinery

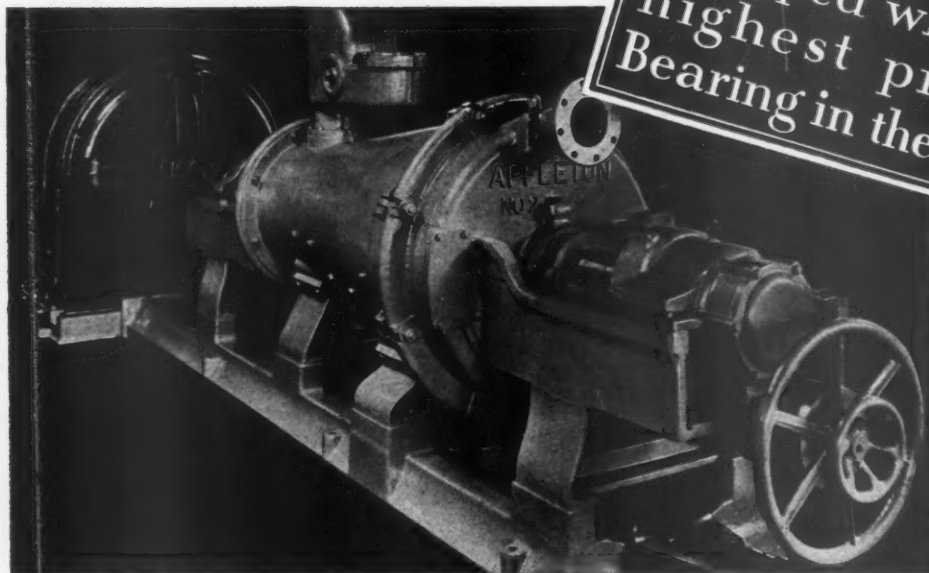
SHARTLE BROS. MACHINE CO.,

MIDDLETOWN, OHIO

---

 ANOTHER MANUFACTURER IN THE PAPER INDUSTRY THAT USES SKF BEARINGS
 

---

**APPLETON MACHINE CO.**

Equipped with the  
highest priced  
Bearing in the World

## GOOD JORDANS DESERVE GOOD BEARINGS AND APPLETON USES SKF

APPLETON JORDANS could be equipped with cheaper bearings but ... the manufacturers feel that there is only one way to turn out a high grade machine, and that is by using SKF Ball Bearings. Years of experience have proved their judgment correct for SKF not only do the work well but are lowest in cost per bearing hour.

Considering but a few of the many advantages secured with SKF we find that

the plug is accurately centered ... and stays that way. SKF Bearings show hardly a trace of wear in the hardest service and never require adjustments. As a result, refined stock of uniform quality is the rule. Uneven wear of the knives or damage to the shell is eliminated. Maintenance is low too, for the housings effectively exclude moisture and retain lubricant for long periods.

**SKF Industries of California, Inc.**221 Eleventh St.  
San Francisco480 Burnside St.  
Portland, Oregon1114 South Hope St.  
Los Angeles

---

 EQUIPPED WITH THE HIGHEST PRICED BEARING IN THE WORLD
 

---

*Means just this*

# SKF

**Ball and Roller Bearings**

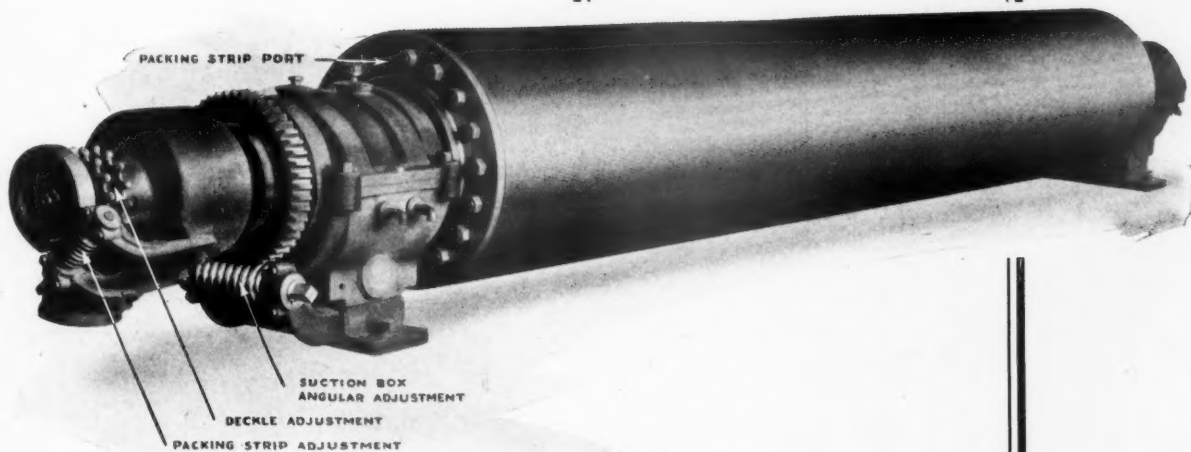
That the manufacturers whose product is illustrated above preferred to pay more for their bearings and less for servicing or replacing them. They preferred to pay a higher price in the beginning than many times this higher price in the end. And, finally, they preferred to economize by using SKF bearings because they are made to do their job, not to fit a price list.

When writing to S. K. F. INDUSTRIES, INC., please mention PACIFIC PULP AND PAPER INDUSTRY



# SAVE!

25% steam saving in  
dryers was effected on  
a newsprint machine  
running at 1000 F.P.M.  
after a Downingtown  
(Kilberry Type) Suc-  
tion Roll was installed  
in third press. Informa-  
tion about the new  
Downingtown Suction  
Couch and Suction  
Press Rolls, with Ad-  
justable Packing  
Strips and Deckles,  
sent on request.



**Downingtown  
Mfg. Company  
Downingtown  
Penna., U. S. A.**

# NOBLE

## Paper Mill Equipment

that keeps Machines producing

---

**The New Revolutionary  
Pre-Hydration System**

---

**Jordans—8 Models  
for every type of paper**

---

*Jordan Fillings*

**Beaters  
Fast Circulating  
High Density  
Hollanders**

*Beater Fillings*

---

**Board Machines**

---

**Stuff Chests  
Agitators  
Pumps**

---

# WOOD

**MACHINE COMPANY**

HOOSICK FALLS, N. Y.





This 14-foot diameter rotary digester was built by Biggs for special process operation at the plant of the Sylva Paper Board Company, Sylva, N. C. All seams were electrically welded. Test, 225 pounds. The welding is done under Biggs procedure control, and has been approved and accepted by all important insurance companies for high pressure construction.

Riveted or Welded equipment built and erected by Biggs is now used all over the world for cooking and bleaching straw, grass, bagasse, wood fibre, cotton linters, and other materials used in manufacturing paper, boxboard, strawboard, and similar paper products.

Biggs Welded Vessels are accepted for installation in localities where the A. S. M. E. code has been adopted for unfired pressure vessels.

Biggs now offers you all-welded rotary, tumbling, sulphate and sulphite digesters, as well as other vessels in all-welded construction. The Biggs perfected welding process by which they are produced is the consummation of four long years of research and development. Biggs Welded Vessels insure you the utmost uniformity safety, and reliability.

The Biggs weld is stronger than the plate itself. Biggs Welded Vessels have been accepted and approved by all the leading insurance companies without reference to size or working pressure. Biggs All-welded Digesters and similar equipment built by Biggs are being accorded the same confidence as has been enjoyed by Biggs riveted construction throughout the paper and allied industries.

A reputation of more than 40 years' standing is squarely behind every Biggs welded vessel. Biggs' complete erecting service is also at your command. Whether your requirements are for welded or riveted types, for globe, cylinder, tumbling or stationary digesters, Biggs' experience and facilities will prove most valuable to you. Our story is sketched pictorially in our newest folder, "Unusual Steel Plate Construction". May we send you a copy?

## The BIGGS BOILER WORKS COMPANY

Buchtel and Case, AKRON, OHIO

NEW YORK

DETROIT

CHICAGO

# BIGGS

**ROTARIES**  
for years of dependable  
cooking and bleaching..



1. Biggs Welded Rotary Digester, 14 ft. diameter. 2. Biggs 14 ft. Riveted Rotary Digester. 3. Biggs Standard Cylinder Rotary Bleaching Boilers on structural steel foundations. 4. Tumbling Digester.

### Among Biggs Installations:

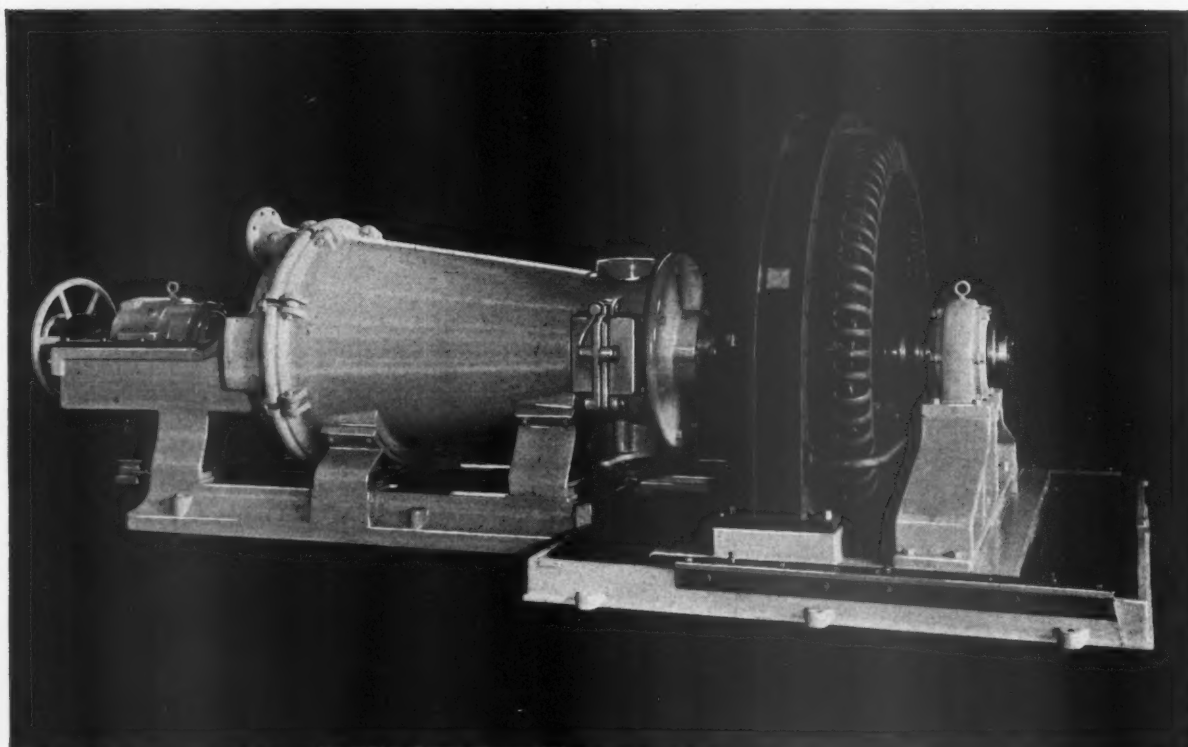
Akron Paper Co., Akron, Ohio  
American Straw Board Co.,  
(10 plants), Akron, Ohio  
Antioch Paper Co., Antioch, Calif.  
Australian Paper Mills,  
Sydney, Australia  
Ball Bros. Co., Noblesville, Ind.  
Beckett Paper Co., Hamilton, Ohio  
Beloit Box Board Co., Beloit, Wis.  
California Paper & Board Mill Co.,  
Antioch, Calif.  
J. G. Cherry Co., Tama, Iowa  
Cleveland-Akron Bag Co., Cleveland, Ohio  
Celotex Company, New Orleans, La.  
Consolidated Water Power & Paper Co.,  
Appleton, Wis.  
Diamond State Fibre Co., Bridgeport, Pa.  
Empire Paper Co., Vincennes, Ind.  
Fuji Paper Co., Tokyo, Japan  
Fir Tex Insulating Board Co., St. Helens,  
Ore.  
Fibre Board Products, Inc., Stockton,  
Calif.  
Fox Paper Co., Lockland, Ohio  
Herman Garbe, Shanghai, China  
Hinde & Dauch Paper Co., Sandusky, Ohio  
Harriman Co., Harriman, Tenn.  
John H. Heald Co., Lynchburg, Va.  
International Alcohol Corp., Fullerton, La.  
Kalamazoo Paper Co., Kalamazoo, Mich.  
Marshall Paper Co., Turner Falls, Mass.  
Marshall Bros., Inc., Yorklyn, Dela.  
Montreal Paper Co., Sorel, P. Q.  
Maizwood Prod. Co., Des Moines, Ia.  
North Star Mfg. Co., Coffeyville, Kansas  
Roanoke Fibre Board Co., Roanoke Rapids,  
N. C.  
River Raisin Paper Co., Monroe, Mich.  
Standard Paper Mfg. Co., Richmond, Va.  
Sylva Paper Board Co., Sylva, N. C.  
Southern Extract Co., Knoxville, Tenn.  
Peter J. Schweitzer, Elizabeth, N. J.  
Port Huron Sulphite & Paper Co., Port  
Huron, Mich.  
United Paper Board Co., New York City  
Wels Paper Mill Co., Quincy, Ill.

When writing BIGGS BOILER WORKS please mention PACIFIC PULP AND PAPER INDUSTRY



## A NEW DEVELOPMENT IN JORDAN CONSTRUCTION FOR SUPERIOR JORDAN PERFORMANCE

Greater accuracy and more efficient operation came with the adoption of anti-friction bearings on Jordan Engines. Appleton Jordans were among the first to offer this improvement. But the permanently centered plug and shaft offered the opportunity for the construction of a still more efficient refining engine. It is here now — The Appleton Close-Coupled Jordan — a new development in Jordan construction backed by years of Jordan building experience. . .



*Patents Applied For*

## ...THE APPLETON CLOSE-COUPLED JORDAN ENGINE

With this new development in Jordan construction the motor is direct connected to the shaft giving a more efficient power application. This feature makes it possible to use the most modern and highly developed drive yet devised for Jordans — the engine type, split rotor, synchronous motor. The flexible coupling is eliminated. Anti-friction bearings, for efficient, economical operation. It is a compact Jordan that takes up about a quarter less floor space. The Appleton Close-Coupled Jordan is an important improvement in Jordan construction, giving superior Jordan performance.

**THE APPLETON MACHINE COMPANY...APPLETON, WISCONSIN**

*Pacific Coast Representative:*

**PAPER MILL EQUIPMENT COMPANY, American Bank Building, Portland, Oregon**

*When writing APPLETON MACHINE CO. please mention PACIFIC PULP AND PAPER INDUSTRY*

**P.S.M.D.**

## *For Unbroken Running Schedules*

Mill after mill has installed PSMD Malleable Riveted Chain upon the recommendation of its "extra service" by other mills. But the second installation is always the result of its own experience—finding that the chain has the stuff.

PSMD Malleable Riveted is a good employee for pulp mills. It's tough but not a trouble maker — rigid-riveted that keeps it steady — strong and ductile that keeps it on the payroll for years and years.

*Complete stocks for every chain requirement.  
Engineering aid at immediate disposal. . . .*

### **PUGET SOUND MACHINERY DEPOT**

*Established 1887*

**SEATTLE, WASHINGTON**

Office and Salesroom  
322-324 First Ave. So.

PORTLAND, ORE.  
68 First St.

*When writing PUGET SOUND MACHINERY DEPOT, please mention PACIFIC PULP AND PAPER INDUSTRY.*

# FIRE BRICK ARCHES WALLS

## Scientific Buying ....as applied to refractories

What you really buy is performance. Consider price as only one factor in cost—your actual cost is price divided by service.

A. P. Green refractories merit your serious consideration on the basis of direct measurable economy—"They Last Longer"! Their ability to give longer, and sustained service at lower cost is definitely known wherever fire brick service records are kept.

We shall appreciate the opportunity to present facts showing the possibilities of A. P. Green refractories—EMPIRE, KRUZITE, MIZZOU, BIG CHIEF—from the standpoint of lowering fire brick costs in your plant. Our engineers will be glad to consult with you in determining the correct refractories for your furnaces. Our line is complete. Write for a catalog and data.

### A. P. GREEN FIRE BRICK COMPANY

Mexico, Missouri, U.S.A.

*The Most Advanced Fire Brick Plants in the World*

### BIGELOW-LIPTAK CORPORATION

*Furnace Arch and Wall Construction*

DETROIT, MICHIGAN

*Bigelow Suspended Walls  
Liptak Type X Walls  
Liptak Type S Walls*

*Bigelow Suspended Arches  
Liptak Single Suspension Arches  
Liptak Double Suspension Arches*

The combination of the BIGELOW-LIPTAK SUSPENDED WALL and the BIGELOW-LIPTAK Suspended Arch makes possible the construction of large units of special design, often without resorting to the use of expensive special parts and elaborate supporting structures. The method of unit construction relieves the refractory material of all load, as well as of the stresses of expansion and contraction, and enables repairs to be easily and quickly made without the need for cooling the furnace.

Represented in the Northwest by

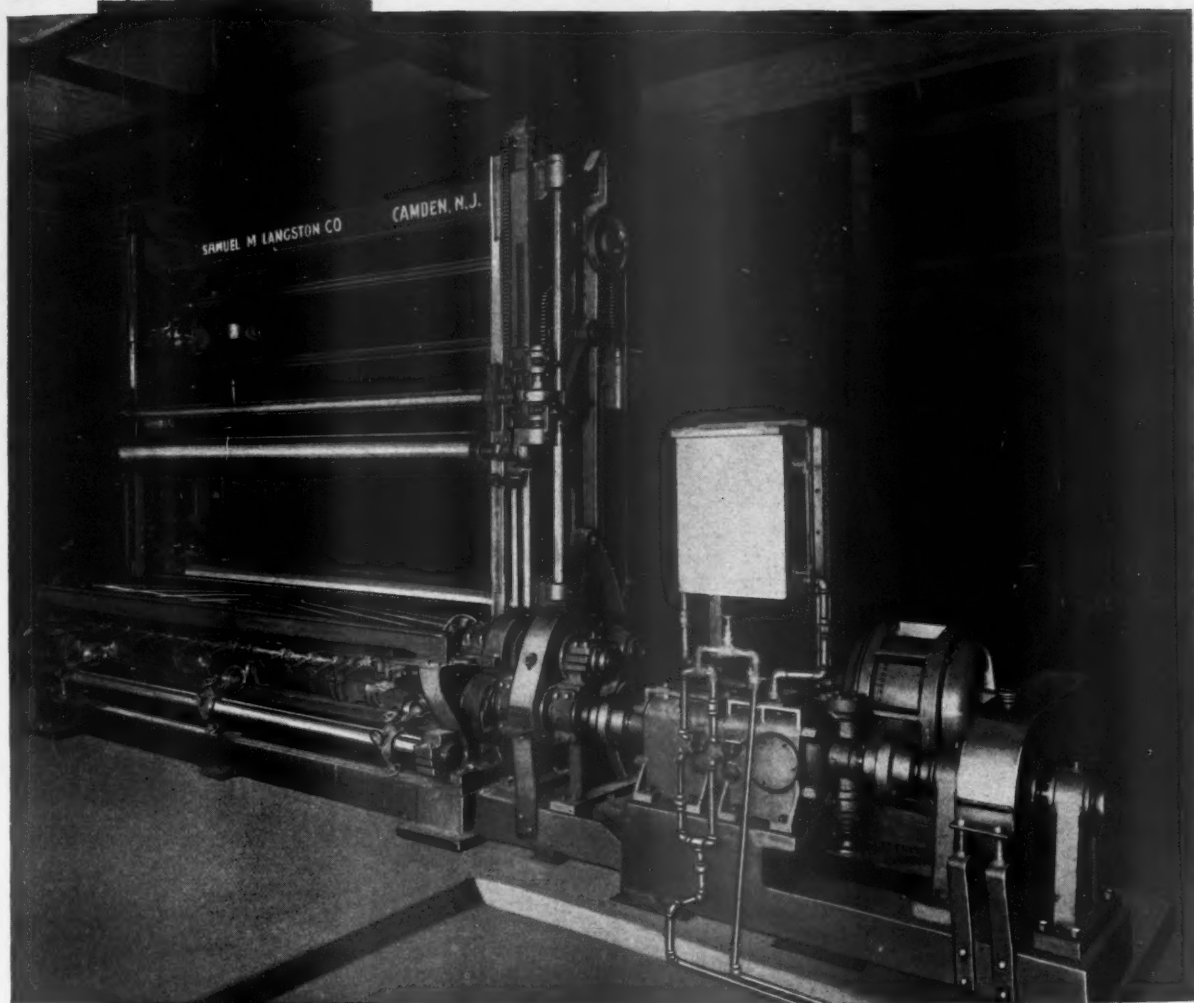
## THE E. J. BARTELLS COMPANY

1212 Sixth Avenue South, Seattle, Washington

49 First St., Portland, Oregon

When writing to E. J. BARTELLS CO. please mention PACIFIC PULP AND PAPER INDUSTRY

# LANGSTON



## SLITTERS



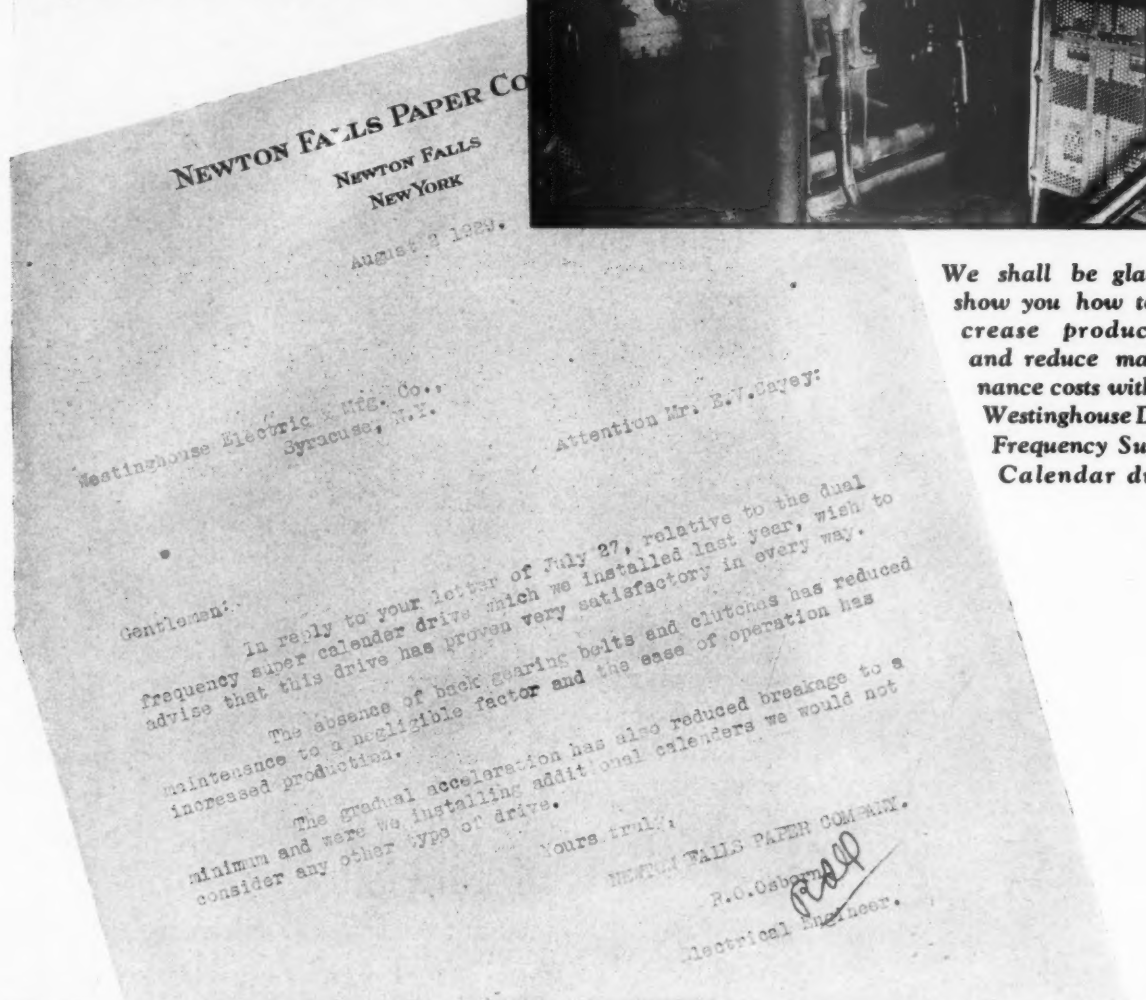
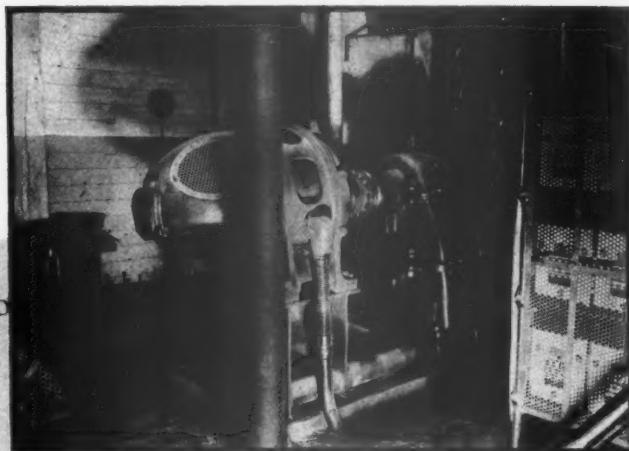
The heavy-duty Langston Slitter can be had in any width, to wind any diameter. Use it as a winder or as a rewinder. Speeds up to 3000 feet per minute. Makes rolls of uniform density, square-edged. Langston's Shear-Cut makes no dust—the paper is *clean-cut*, not ground apart. A catalog is yours for the asking.

**SAMUEL M. LANGSTON CO., Camden, N. J.**



# Satisfactory in every way

--says Mr. R. O. Osborn



We shall be glad to show you how to increase production and reduce maintenance costs with the Westinghouse Dual-Frequency Super-Calendar drive.

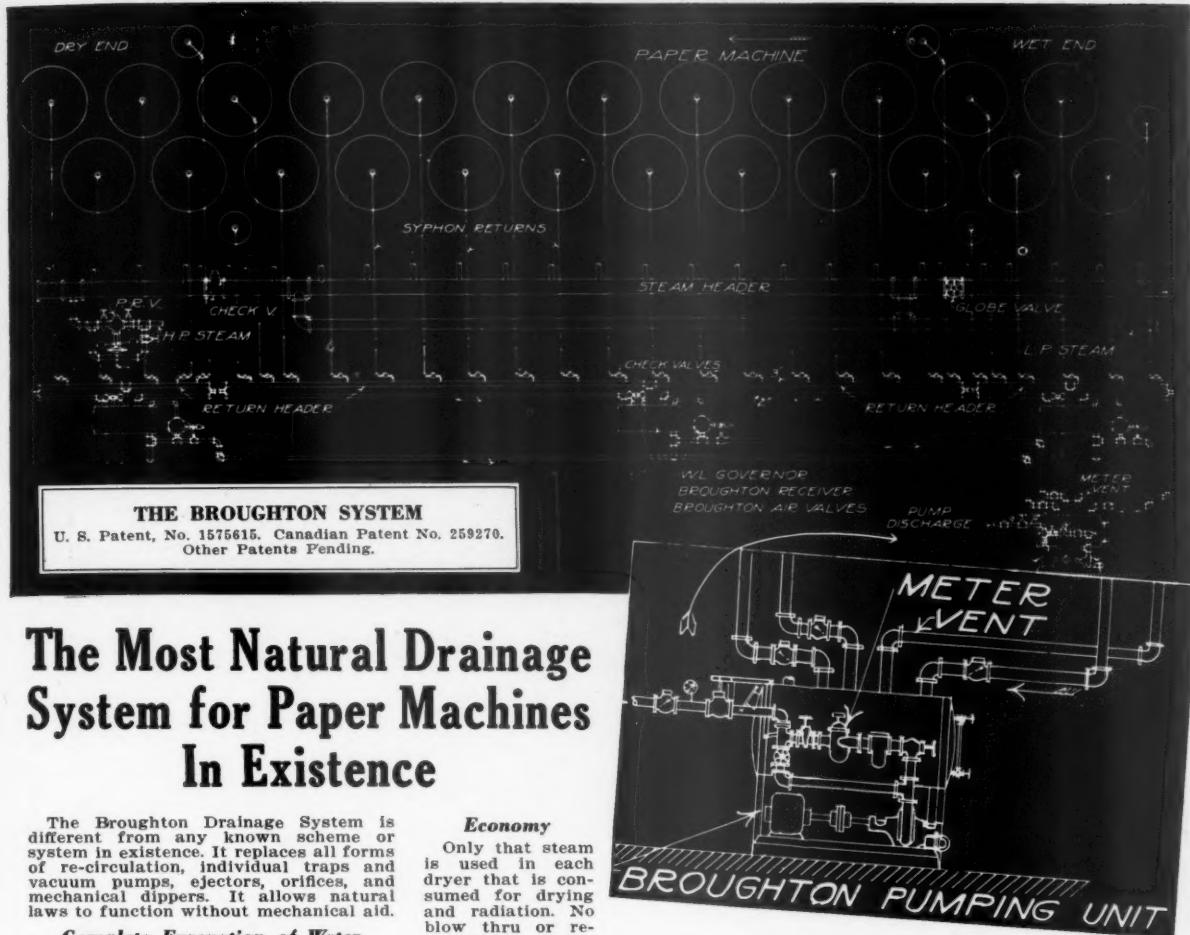
*Service, prompt and efficient, by a coast-to-coast chain of well-equipped shops*

## Westinghouse



T 31028

When writing WESTINGHOUSE ELECTRIC & MFG. CO., please mention PACIFIC PULP AND PAPER INDUSTRY



## The Most Natural Drainage System for Paper Machines In Existence

The Broughton Drainage System is different from any known scheme or system in existence. It replaces all forms of re-circulation, individual traps and vacuum pumps, ejectors, orifices, and mechanical dippers. It allows natural laws to function without mechanical aid.

### Complete Evacuation of Water

Condensation, occurring in the dryers, shuts off the steam flowing into the syphons and return header. Radiation immediately drops the pressure in these lines, and draws the water up and over the syphon bend, and into the return header where it flows by gravity to the Broughton condensation pump and metering unit. The swing checks in the syphons allow each dryer to have its own individual pull. The return header pressure is always equivalent to that of the dryers, assuring a condensate temperature to the power house exactly equal to the steam pressure. The Broughton condensation pump and metering unit will deliver this water to any point desired and at any temperature without the use of any cooling medium. It will operate at any allowed pressure and meter with an accuracy of 99%. The water line governors permit nothing but water to flow into the receiver of the pumping unit. This received is equalized to the lowest pressure feeding into it.

### Elimination of Air

Air is nearly twice as heavy as steam, and whenever present in dryers, it lies at the bottom. Each little slug of water drawn into the syphons by the radiation pull, is followed by steam from the bottom of the dryer. If any air is present, it goes along with it. In the return header the air drops by weight to the lowest possible point, or the Broughton Receiver, where it is released to atmosphere by the specially constructed, thermostatically controlled Broughton Air Valves. These valves allow the air to release automatically and so rapidly that the largest paper machine made can be started from cold to full drying capacity in less than twenty minutes. This complete evacuation of all air is the reason for the extreme operating flexibility of all paper and board machines equipped with the Broughton System.

### Economy

Only that steam is used in each dryer that is consumed for drying and radiation. No blow thru or re-circulation is permitted. No mechanical external power of evacuation is required. The condensate is removed at the same temperature as the steam in the dryers, no drop in

pressure or reflash being allowed. The Broughton System permits the use of less steam per pound of water evaporated than any other scheme or system in existence.

### Operating Pressures

Operating pressure is determined by machine heating surface, ventilation, and speed of production. The Broughton System will permit the lowest possible operating pressure as governed by these three factors. Live steam is never allowed to mix with the process steam, thereby allowing more even and constant back pressure. This, in turn, reacts towards the steadying of basic weights and moisture in the finished sheet. It invariably permits a slightly higher finished moisture content. The back-tender's first remark after a Broughton System installation is made is, "The machine is drying better". The system can be built for one pressure throughout, or for any number of pressures, as is desired.

### Easy to Install

Small piping is all that is required. The largest paper machine made needs no larger than a three-inch return header, three-quarter-inch syphons, and a two-inch pump discharge. The system can be built during the week and cut over on Sunday, no shut down being necessary.

### Prices

Due to its extreme simplicity and low cost of installation, the cost of the Broughton System is well within the reach of any mill, regardless of size.

Write for further information.

**Healy-Ruff Company**  
802 Hampden Avenue,  
St. Paul, Minn.

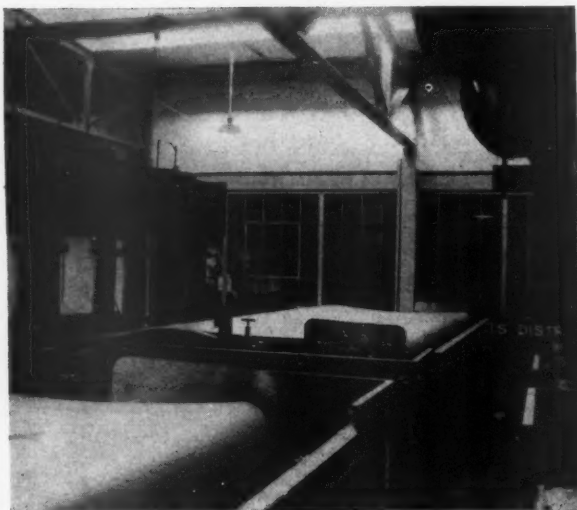
There are more than one hundred and fifty successfully operating Broughton Systems in the United States and Canada. A few representative jobs are as follows:

|                          |           |
|--------------------------|-----------|
| Inland Empire Paper Co.  |           |
| Spokane, Wash.           | 3 Systems |
| Cascade Paper Company    |           |
| West Tacoma, Wash.       | 2 "       |
| Fiberboard Prod. Co.     |           |
| Emeryville, Calif.       | 2 "       |
| Fiberboard Prod. Co.     |           |
| Los Angeles, Calif.      | 1 "       |
| U. S. Gypsum Co.         |           |
| Gypsum, Ohio             | 1 "       |
| U. S. Gypsum Co.         |           |
| Oakfield, N. Y.          | 1 "       |
| U. S. Gypsum Co.         |           |
| N. Kansas City, Mo.      | 1 "       |
| Marathon Paper Mills     |           |
| Rothschild, Wisc.        | 3 "       |
| Marathon Paper Mills     |           |
| Menasha, Wisc.           | 2 "       |
| Marathon Paper Mills     |           |
| Ashland, Wisc.           | 1 "       |
| Wausau Paper Mills       |           |
| Brokaw, Wisc.            | 4 "       |
| Dells Pulp & Paper Co.   |           |
| Eau Claire, Wisc.        | 3 "       |
| Watab Pulp & Paper Co.   |           |
| Sartell, Minn.           | 2 "       |
| Waldorf Paper Products   |           |
| St. Paul, Minn.          | 2 "       |
| Kimberly Clark Co.       |           |
| Kimberly, Wisc.          | 1 "       |
| Kimberly Clark Co.       |           |
| Neenah, Wisc.            | 2 "       |
| Laurelton Company        |           |
| Grand Mere, P. Q.        | 7 "       |
| Pejepscot Paper Co.      |           |
| Brunswick, Maine         | 2 "       |
| Hollingsworth & Vose Co. |           |
| East Walpole, Mass.      | 3 "       |

# LOW COST OF DECKERING WITH FEINC FILTER DECKERS

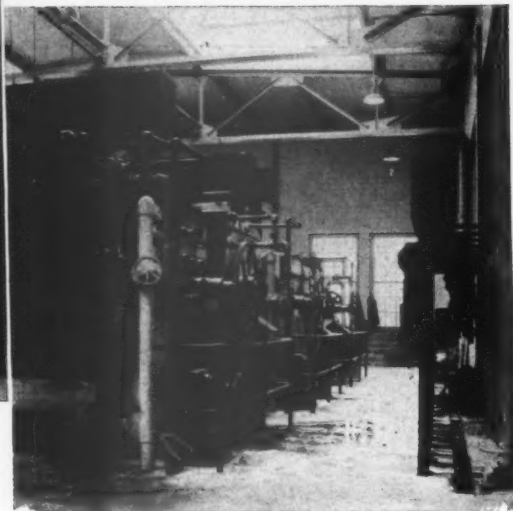
Vital factor in Maine Seaboard Company's order for

8 FEINC Ground Wood and  
2 FEINC Sulphite-White Water Deckers



*Horizontal String Discharge of Sheet on Deep Submergence Machines.*

*Battery of F. E. Inc. Deckers.  
Showing Sturdy Drive.*



With a guaranteed life of at least two years for each covering wire, the saving in cost of wire as compared with old time or other units made Feinc units attractive.

With a guaranteed loss in fibre in white water less than 1 lb. per 1,000 gallons the savings with Feinc Deckers is enormous whenever any white water must be vented. Clear white water makes the best shower water.

WRITE OUR NEAREST OFFICE FOR DETAILS

In Canada  
FILTRATION ENGINEERS, Ltd.  
Montreal, Que.

Sault Ste. Marie, Ont.

W. J. WESTAWAY CO., Ltd.  
Hamilton and Montreal  
(Sewage Disposal)

In Europe  
MASCHINENFABRIK IMPERIAL  
G. M. B. H.  
Meissen, Germany

**FILTRATION ENGINEERS INCORPORATED**  
  
**SERVICE ECONOMY**  
General Offices and Plant  
**NEWARK NEW JERSEY**

Cable Address  
"FEINC—NEW YORK"

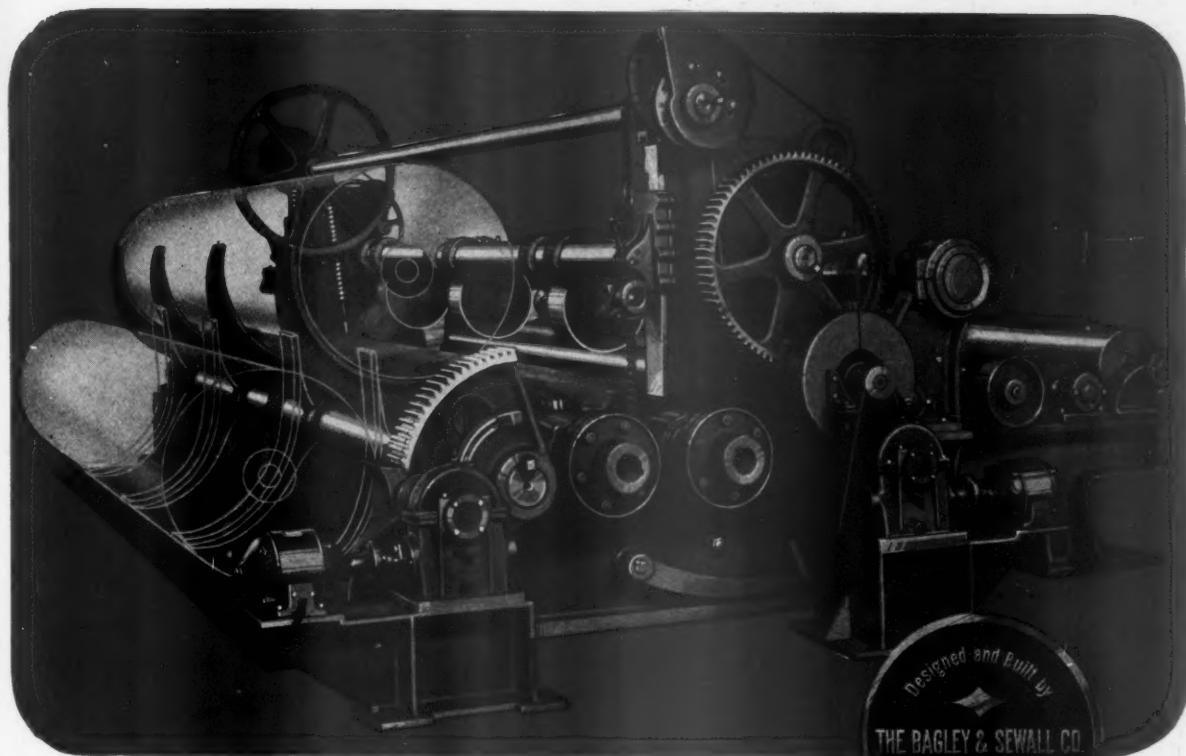
Woolworth Bldg.  
NEW YORK, N. Y.

355 Everett St.  
PORTLAND, ORE.

1135 Mission St.  
SAN FRANCISCO, CALIF.

CONTINUOUS FILTERS — DECKERS  
SAVE - ALLS - WASHERS for PAPER PULP

*When writing FILTRATION ENGINEERS INCORPORATED, please mention PACIFIC PULP AND PAPER INDUSTRY*



## **Saving Rejected Rolls, Precious Time and Human Backs**

No rejects in rolls wound on the Improved Bagley & Sewall High Speed Winder. It's built to turn out only *perfect ones*. Adjustable drums drop the shaft into the pinch just far enough to insure perfectly tight winding at the start. Compensating counter balances maintain uniform tightness till completion. Then, at the touch of a button, the roll is cradled, lifted from the winders and deposited gently on floor or truck, in 12 seconds, without jar or jostle, without overhead tackle or straining backs. Smooth, uniform rolls at smooth, uniform speed up to 3000 feet a minute. You can't appreciate modern winder operation till you've seen this one.

*We'd like to tell you ALL about it — write us*

# ***The* Bagley & Sewall Co.**

**Watertown, N. Y.**

---

When writing BAGLEY & SEWALL CO., please mention PACIFIC PULP AND PAPER INDUSTRY.





# Foresight Much Better Than Hindsight

If it is a packet of pins, or a pair of shoe laces, go buy them.

But when it comes to anything as important as a paper machine or even a jordan, a pump, or a beating engine, you have a sky of another hue.

## *When Buying Beating Engines*

Then it is that the shrewd buyer starts looking around. He wants to know something about the personnel behind the product. He'll have a hundred questions on design and construction—and price. He has long since learned that the time to get to the bottom of things is before he buys, not after the shipment is on his siding.

## *Take Yourself For Instance*

When you are in the market for beaters, consider Mid-West High Speeds before you place your order. You'll find that "There is a world of difference in beaters" and that Mid-West has something mighty interesting both in design and price.

**High Speed  
Beaters—and  
Other Mid-West  
Products in which  
You May Be In-  
terested . . . . .**

High Speed Beaters, Continuous  
Automatic Systems for Roofing  
Felt, Stock Extractors, Cylinder  
Washers, Lever Type Dump  
Valves, Falk Gear Reducers,  
Bandless Type Rolls, Fly Bars,  
Bed Plates, Stuff Chests and Agi-  
tators, Dayton Cog Belt Drives.

**THE MID-WEST MACHINE CO.**

DAYTON, OHIO

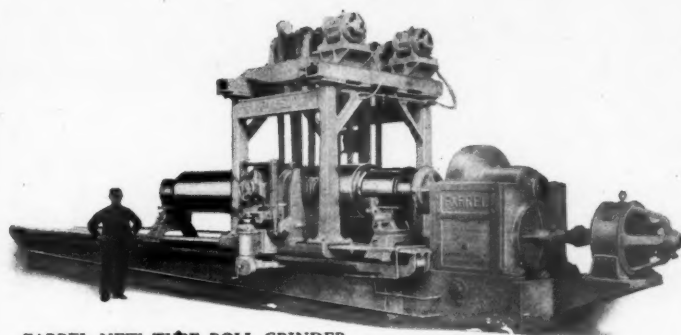
Pacific Coast Representative

MR. JAY PLATT HAMERSLAG, 655 Russ Bldg.,  
San Francisco, California



*The* **MIDWEST MACHINE CO.**  
DAYTON OHIO

*When writing The Midwest Machine Co., please mention PACIFIC PULP & PAPER INDUSTRY*

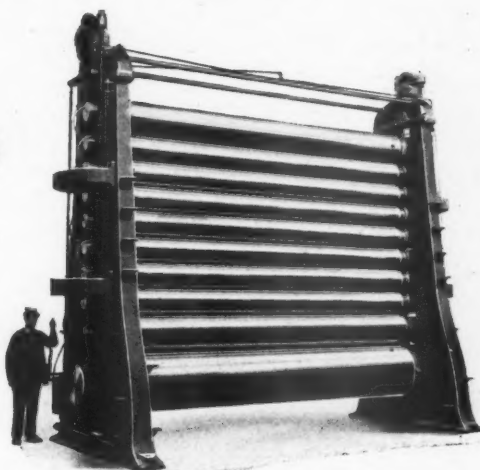


FARREL NEW TYPE ROLL GRINDER

**FARREL NEW TYPE ROLL GRINDER** is made in 24", 32", 36" and 42" sizes, all electrically driven throughout and fitted with Geared Head, Automatic Lubricating System and combination Swing Rest and Crowning Device, which provides for greater accuracy and faster grinding with a minimum expenditure of time and labor.

## FARREL CALENDERS

are made with  
HYDRAULIC  
ELECTRIC  
or  
RATCHET  
LIFT  
all operated  
from the floor.



178" STACK WITH HYDRAULIC LIFT

## FARREL CALENDER ROLLS

are made in  
all sizes up  
to and including  
**298"**  
on the face.

The **FARREL Indicating Roll Caliper** is a precision instrument of very light weight, with which rolls can be calipered to the end of the face without reversing the instrument. Only two adjustments are necessary in changing from one diameter roll to another. Moves freely along the face of the roll and shows the slightest variation in the diameter at any point.

*FARREL Products for the paper mill are favorably known all over the world. There are more FARREL rolls in use in this country than all other makes combined.*



FARREL INDICATING ROLL CALIPER

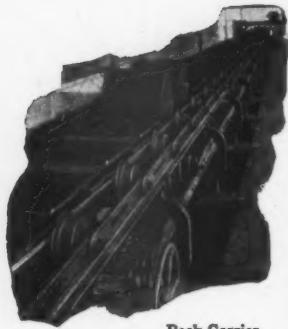
## FARREL-BIRMINGHAM COMPANY INC.

ANSONIA, CONN.

Successors to: Farrel Foundry & Machine Co., Ansonia, Conn., Est. 1848.

Birmingham Iron Foundry, Derby, Conn., Est. 1836.

When writing FARREL-BIRMINGHAM CO., INC., please mention PACIFIC PULP & PAPER INDUSTRY



Peck Carrier



SS-850 Chain for suspending and operating barking drums

'C' Class Combination Chain

'400' Class Chain

'RC' Class Chain for power transmission



Belt Conveyor



&gt;FLINT-RIM&lt; Sprocket



'S' Spur attachment



Plain Bearing



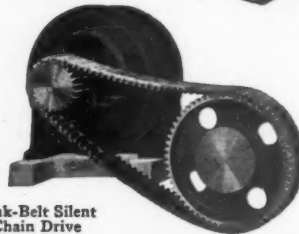
&gt;HEXTOP&lt; Grease Cup



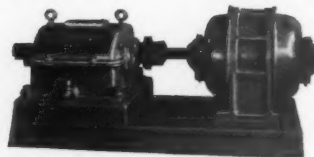
Link-Belt Crawler



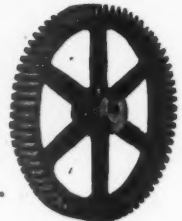
Channel-top sorting-table conveyor, for handling logs from barking drums



Link-Belt Silent Chain Drive



Link-Belt Herringbone Speed Reducer (Sykes tooth form)



Gears of all kinds



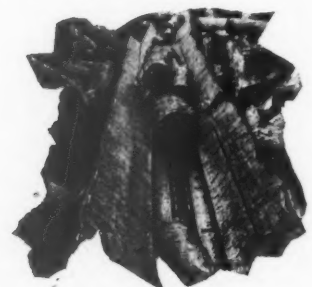
Friction Clutch



Malleable Iron Safety Collar



Style "DS" Take-up



Chain Conveyor handling logs

## Everything for Handling Materials, and Driving Machinery

EVERY mill should use the new 1088-page Link-Belt General Pricelist Catalog 500, which completely covers in list prices and descriptions, the machinery equipment to keep the mill going. Address the nearest office listed below.

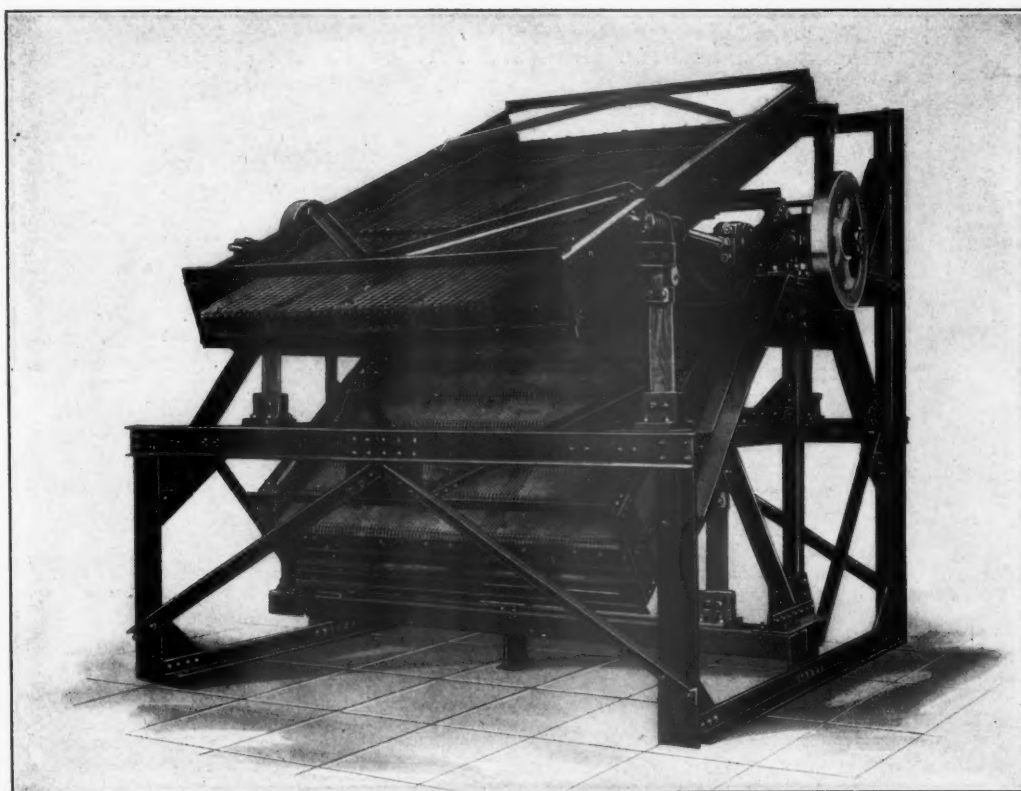
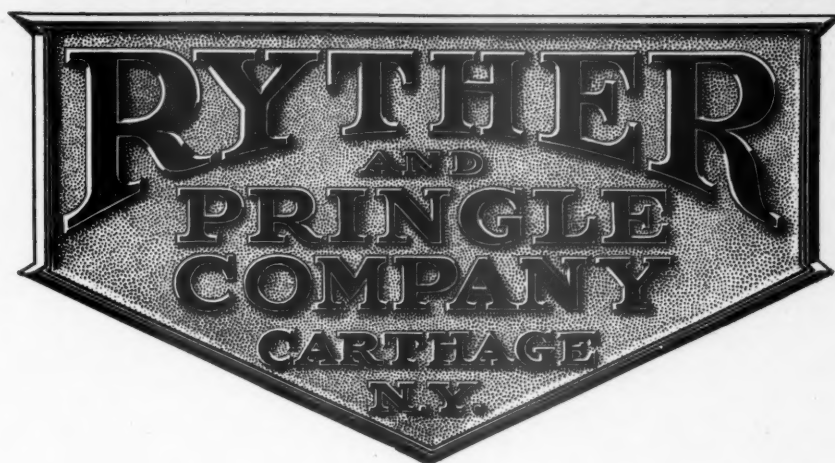
### LINK-BELT COMPANY

Leading Manufacturers of Elevating, Conveying, and Power Transmission Chains and Machinery  
CHICAGO, 300 W. Pershing Road INDIANAPOLIS, 200 S. Belmont Ave. PHILADELPHIA, 2045 W. Hunting Park Ave.

### LINK-BELT COMPANY, PACIFIC DIVISION

San Francisco .....19th and Harrison Sts. Seattle.....820 First Ave. S. Portland, Ore. ....67 Front St.  
Oakland.....526 Third St. Los Angeles.....361-369 S. Anderson St.

# LINK-BELT



## RYTHER HIGH SPEED SCREEN

Send for Bulletin No. 528

CANADIAN INGERSOLL-RAND COMPANY, LIMITED  
10 PHILLIPS SQUARE, MONTREAL, P. Q.

*When writing RYTHER & PRINGLE Co., please mention PACIFIC PULP AND PAPER INDUSTRY.*



# NATIONAL DYES AND NATIONAL SERVICE

**S**UPPLEMENTING the wide range of National Dyes available for paper coloring is the highly specialized service that we render to the paper industry.

Adequately equipped paper laboratories to work out your color problems, and ample warehouse stocks in San Francisco to insure prompt deliveries are part of the service we offer you.

We are always glad to cooperate with you in solving our color problems.



## NATIONAL DYES

**National Aniline & Chemical Company, Inc.**

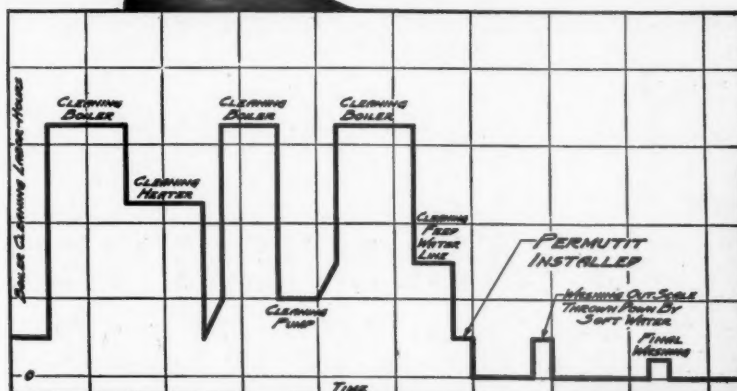
145 Second Street  
San Francisco

40 Rector Street  
New York

CHICAGO  
PHILADELPHIA

CHARLOTTE  
TORONTO

BOSTON  
PROVIDENCE



Note how much time and labor was expended in removing scale before Permutit was installed.

## Scale cleaning gang laid off permanently in this boiler plant

Actual photograph of  
scaled-up boiler tube.

A public service corporation in Salt Lake City, Utah, operates three Wickes vertical water tube boilers that deliver 650 H.P. at normal rating. For boiler feed water they use the city supply which is derived from mountain streams, and contains variable amounts of hardness according to the weather and season. The average is about 14 grains per gallon.

For many years much trouble was experienced in this boiler plant due to scale that continuously deposited in boiler tubes, feed water heater, feed pumps and feed water lines. A cleaning gang was kept constantly at work, and the entire plant operation was difficult and unsatisfactory.

A Permutit engineer was finally consulted and after a thorough investigation, a Permutit Zeolite water softener was installed in September, 1920, to remove absolutely all scale, sludge and mud-forming impurities from the 35,000 gallons of boiler feed makeup water daily.

The results have been very gratifying. All scale troubles have disappeared completely, the cleaning gang has been laid off, and considerable money has been saved in fuel, repairs and tube replacements. A letter from the Manager stated in part:

"Before installing Permutit Equipment at our gas plant, we were experiencing considerable difficulty throughout our entire boiler plant from scale, including feed water heater, feed pump, and feed lines . . . at the present time no scale trouble is experienced . . . our former boiler repairs were necessarily heavy, and at the present time, the only repairs necessary to make is that of removing a thin tube occasionally."

We manufacture all types of equipment for rendering water clean and soft, and our experience with hundreds of firms like the above has given us some very valuable data, much of which has been published in our booklet, "Reducing Fuel and Boiler Plant Operating Costs." Let us send you a free copy.

## The Permutit Company

Apparatus for Removing Impurities from Water

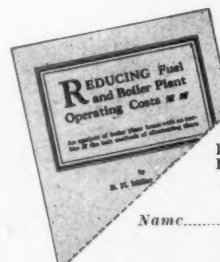
SAN FRANCISCO: 1012-14 BALBOA BUILDING  
LOS ANGELES: 909 WRIGHT CALLENDAR BLDG.

When writing THE PERMUTIT COMPANY please mention PACIFIC PULP & PAPER INDUSTRY



The  
Permutit  
Company

440 Fourth Ave.  
New York



Please send me your free booklet, "Reducing Fuel and Boiler Plant Operating Costs."

Name..... Position.....

Company.....

Address.....



## NO FAIR WEATHER SAILORS

HE WHO HAS BUILT A BUSINESS FROM THE NEBULOUS STAGES OF AN IDEA INTO A THRIVING, ACTIVE, GROWING THING WELL KNOWS THAT A STOUT HEART GOES INTO THE BUILDING. NO "FAIR WEATHER SAILORS" HAVE STEERED THE PULP AND PAPER INDUSTRY OF THE WEST THROUGH THE HARDSHIPS AND UNCERTAINTY OF THE PIONEER YEARS. BUT THOSE WHO HAVE CARRIED THROUGH HAVE SEEN THEIR COURAGE VINDICATED AS THE INDUSTRY HAS GROWN TO MATURITY.

TO THE FIRST PULP AND PAPER MILLS ON THE COAST, GREAT WESTERN ELECTRO-CHEMICAL COMPANY SUPPLIED CHLORINE. THE SUPPLY WAS UNFAILING, THE PRODUCT DEPENDABLE. TODAY, GREAT WESTERN, TRIED AND PROVEN WITH THE PIONEERS, REJOICES IN THE MATURITY OF THE INDUSTRY, AND CONTINUES TO SUPPLY PRODUCT AND SERVICE UNSURPASSED.



**GREAT WESTERN  
ELECTRO-CHEMICAL  
COMPANY**

SAN FRANCISCO  
PLANT: PITTSBURG, CALIF.  
SEATTLE: 514 FOURTH AVENUE

*When writing GREAT WESTERN ELECTRO-CHEMICAL Co., please mention PACIFIC PULP & PAPER INDUSTRY.*



## New Precision Model Williams Freeness, Beating and Consistency Testing Outfit



### FEATURES—

**Accuracy.** Has automatic stop-watch control. Turning lever starts flow, also starts watch. Both instantly stopped by reversing lever. Merely read seconds elapsed.

U. S. Bureau of Standards Certificate of Calibration furnished. An instrument of International Scope.

**Wide Range.** Gives freeness of all kinds of stock from grease-proof to kraft pulp.

**Easily Operated.** Even by those without technical training.

**Determines Consistency as Well as Freeness.** Removing graduated glass cylinder leaves sample on loose screen which may be pressed, dried and weighed, giving bone dry fibre content of wet stock taken.

**Makes Hand-Made Sheets.** Useful for color, size, dirt tests and fibre in white water, etc.

**WILLIAMS APPARATUS CO.**

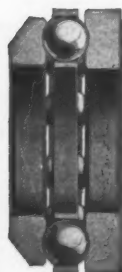
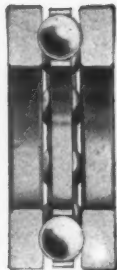
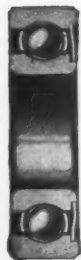
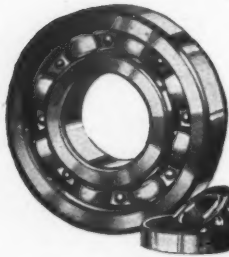
WATERTOWN, N. Y.



*When writing to WILLIAMS APPARATUS CO. please mention PACIFIC PULP AND PAPER INDUSTRY*



*There is a*  
**PRECISION BEARING**  
*for every*  
**LOAD,**  
**SPEED *and* DUTY**



N-1041

**I**N the entire range of anti-friction bearing service, there is not a combination of conditions which cannot be met—economically, and with entire assurance of continued satisfaction—with some one, or several, of the PRECISION Bearings from the NORMA-HOFFMANN line.

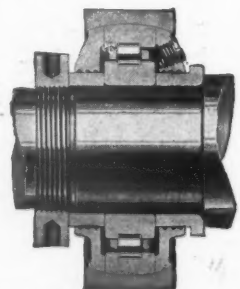
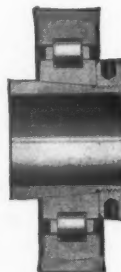
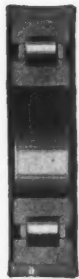
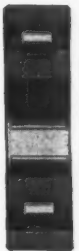
There need be no compromise, no half-solutions of the problem, NORMA-HOFFMANN engineers are never compelled to recommend a bearing that is "good-enough". In the comprehensive and diversified NORMA-HOFFMANN range of types and sizes, there is always a bearing that is the "right bearing" for the purpose.

Think what this means, where a single problem may require several bearing applications differing in conditions and duty.

PRECISION, a *standard* which is rarely approached but never excelled, outside the NORMA-HOFFMANN factories—*standard* bearings specially applied—one undivided responsibility covering every bearing application—where else can you get the all-comprehensive value which is here represented?

*Write for Catalogs 904, 917 and 921,  
 giving complete engineering data on the  
 NORMA-HOFFMANN Bearing line.*

**NORMA-HOFFMANN**  
**PRECISION BEARINGS**



SAN FRANCISCO: Irvin Silverberg & Co., 541 Van Ness Ave. Ahlberg Bearing Co. of California, Inc., 549 Golden Gate Ave.

SEATTLE: Ahlberg Bearing Co. of California, Inc., 512 East Pike St.

LOS ANGELES: Joseph A. Masterson & Co., 1822 So. Hope St. Ahlberg Bearing Co. of California, Inc., 1708 So. Grand Ave.

PORTLAND: Ahlberg Bearing Co. of California, Inc., 409 Burnside Ave.

PHOENIX, ARIZ.: Ahlberg Bearing Co. of California, Inc.

# When 1,000 ft. of News was news!



Jan. 16, 1915

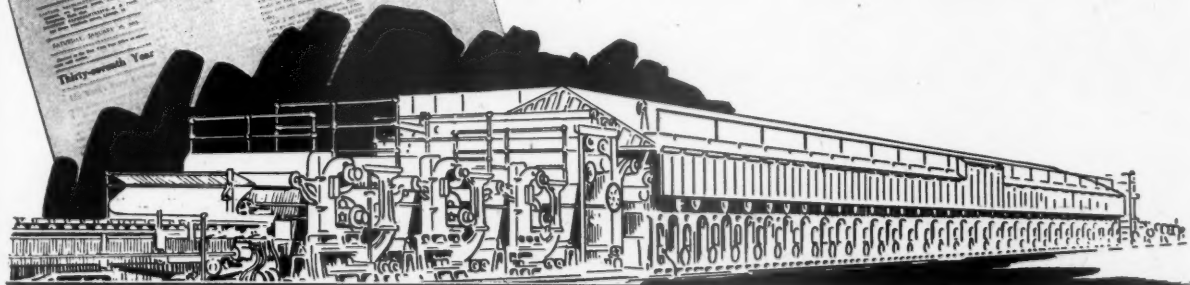
12,000 sq. ft. a minute

was the output proposed for a new Rice, Barton & Fales Machine then being tested at a mill in Maine. A sheet 12 feet wide, at the unprecedented speed of 1,000 ft. per minute!

and today

19,800 sq. ft. a minute

is the regular production on a 234-in. Rice, Barton & Fales Machine at the Port Angeles Mill of the Washington Pulp & Paper Company . . . a sheet 18 feet wide, 1,100 ft. per minute!



**RICE, BARTON & FALES**  
*Incorporated*  
**WORCESTER, MASSACHUSETTS**  
*Paper Making Machinery Since 1837*

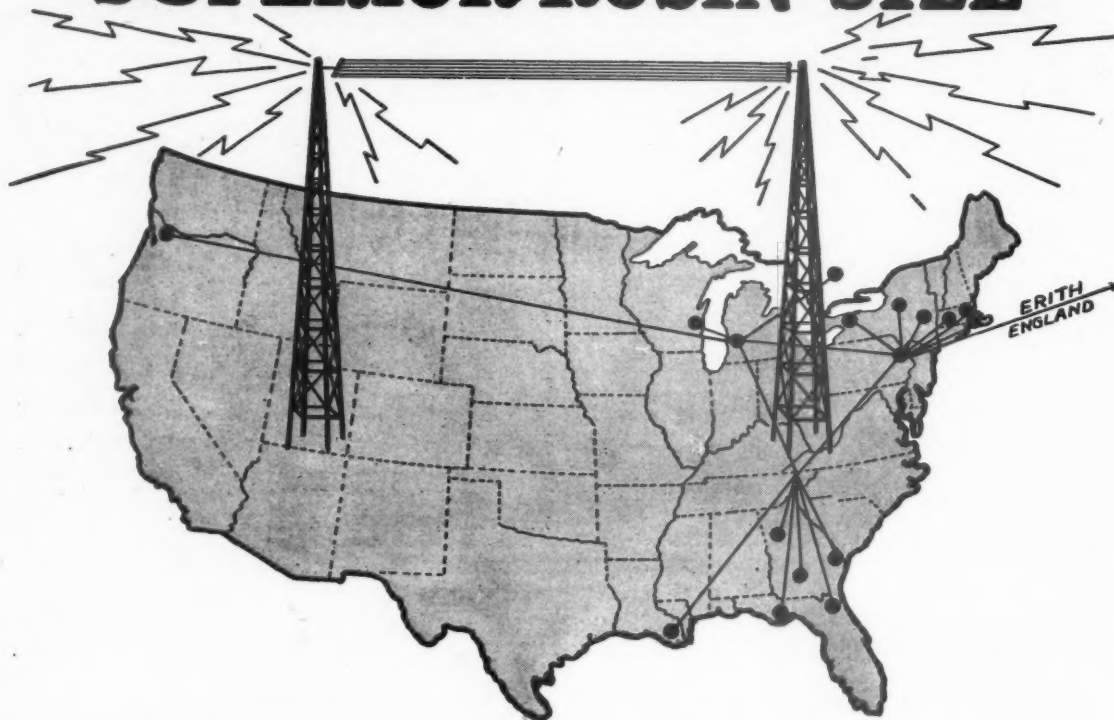
## EXPERIENCE

Making good paper at nearly fifteen miles an hour is today's answer to the production problem . . . an answer made possible by engineering skill and modern facilities, backed by the experience of nearly one hundred years.



When writing RICE, BARTON & FALES, INC., please mention PACIFIC PULP & PAPER INDUSTRY

# BROADCASTING SUPERIOR ROSIN SIZE



With the starting of operations in our new factory at Portland, Oregon, we complete a *coast to coast* and an International "*Hook-up of Stations*" for supplying SUPERIOR ROSIN SIZE and other chemicals.

Service will be good from your "*Local Station*" and your 1930 "*Program*" will be free from "*Static*" if you use SUPERIOR CHEMICALS.

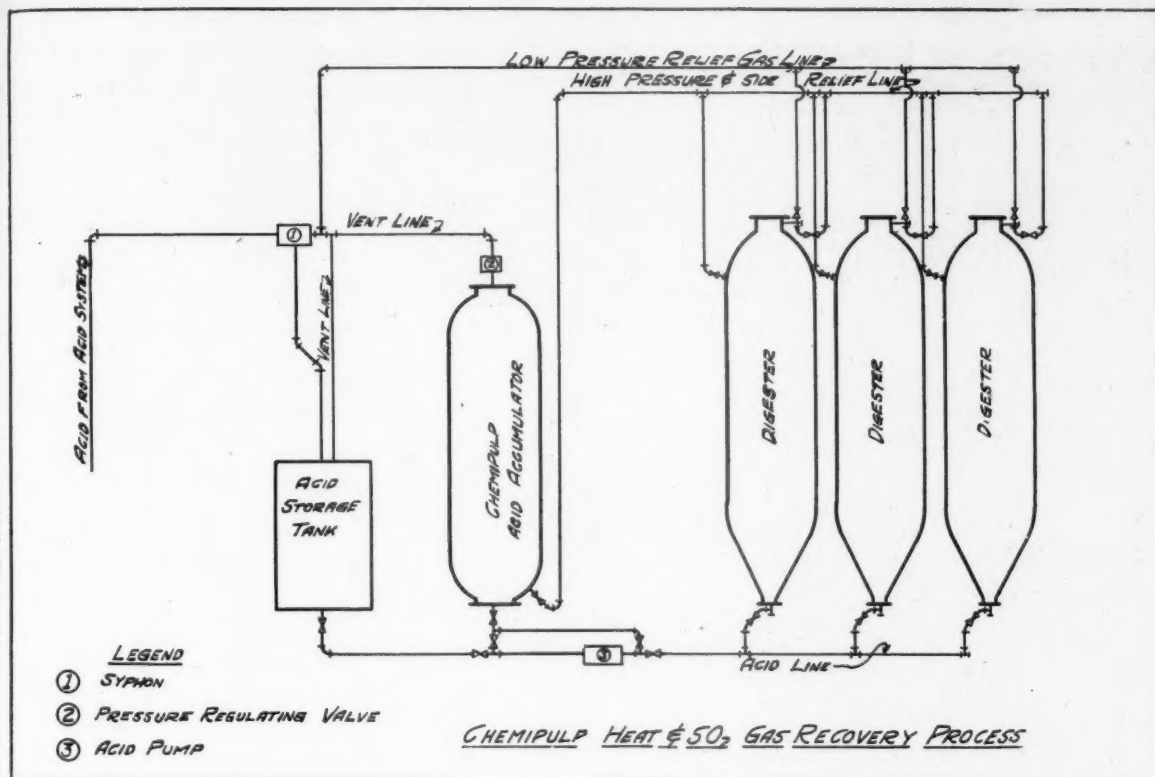
TUNE IN WITH P. M. C.

## PAPER MAKERS CHEMICAL CORP.

EASTON, PA.  
KALAMAZOO, MICH.  
NORTH MILWAUKEE, WIS.  
HOLYOKE, MASS.  
STONEHAM, MASS.  
BOSTON, MASS.

ALBANY, N. Y.  
LOCKPORT, N. Y.  
CARTHAGE, N. Y.  
PORTLAND, OREGON  
PENSACOLA, FLA.  
JACKSONVILLE, FLA.

SAVANNAH, GA.  
FARGO, GA.  
ATLANTA, GA.  
MARRERO, LA.  
BURLINGTON, ONTARIO  
ERITH, ENGLAND



## CHEMIPULP HEAT & SO<sub>2</sub> GAS RECOVERY PROCESS

A revolutionizing process for hot SO<sub>2</sub> gas and liquor recovery which effects a saving of 2000 to 2500 pounds of steam for each ton of sulphite pulp produced, reduces sulphur consumption by 5% or more, absolutely eliminates monosulphite deposits and appreciably increases the yield above that obtained by the ordinary sulphite pulping process. It opens the way to the manifold advantages obtained by the rapid penetration of chips with hot acid and permits a shortening of the cooking cycle while improving the pop test and tearing quality as well as materially reducing the bleach consumption.

Purchasers recognizing the great value in Chemipulp Processes. Units ordered but not yet in operation.

RESTIGOUCHE CO.,  
Ltd., Athol, N. B.

JAMES McLAREN CO.,  
Ltd., Masson, P. Q.

OLYMPIC FOREST  
PRODUCTS CO.,  
Port Angeles, Wash.

PENOBSCOT CHEMI-  
CAL FIBRE CO.,  
Great Works, Maine

Patented in Canada and U. S. A.

**MORE AND BETTER PULP AT  
LOWER COST**

## CHEMIPULP PROCESSES

Inc.

Chemical Pulp Mill Engineers

Woolworth Bldg.

WATERTOWN, N. Y.

Pacific Coast Office: 1017 White Building, Seattle, Wash.

**Satisfied Customers  
With Chemipulp  
Process Operating:**

ALGONQUIN PAPER  
CORPORATION, Ogdens-  
burg, N. Y.

ANGLO - CANADIAN  
PULP AND PAPER CO.,  
Limoulu, Que.

NEKOOSA - EDWARDS  
PAPER CO., Port Ed-  
wards, Wis.

HOBERG PAPER & FIBER  
CO., Green Bay, Wis.

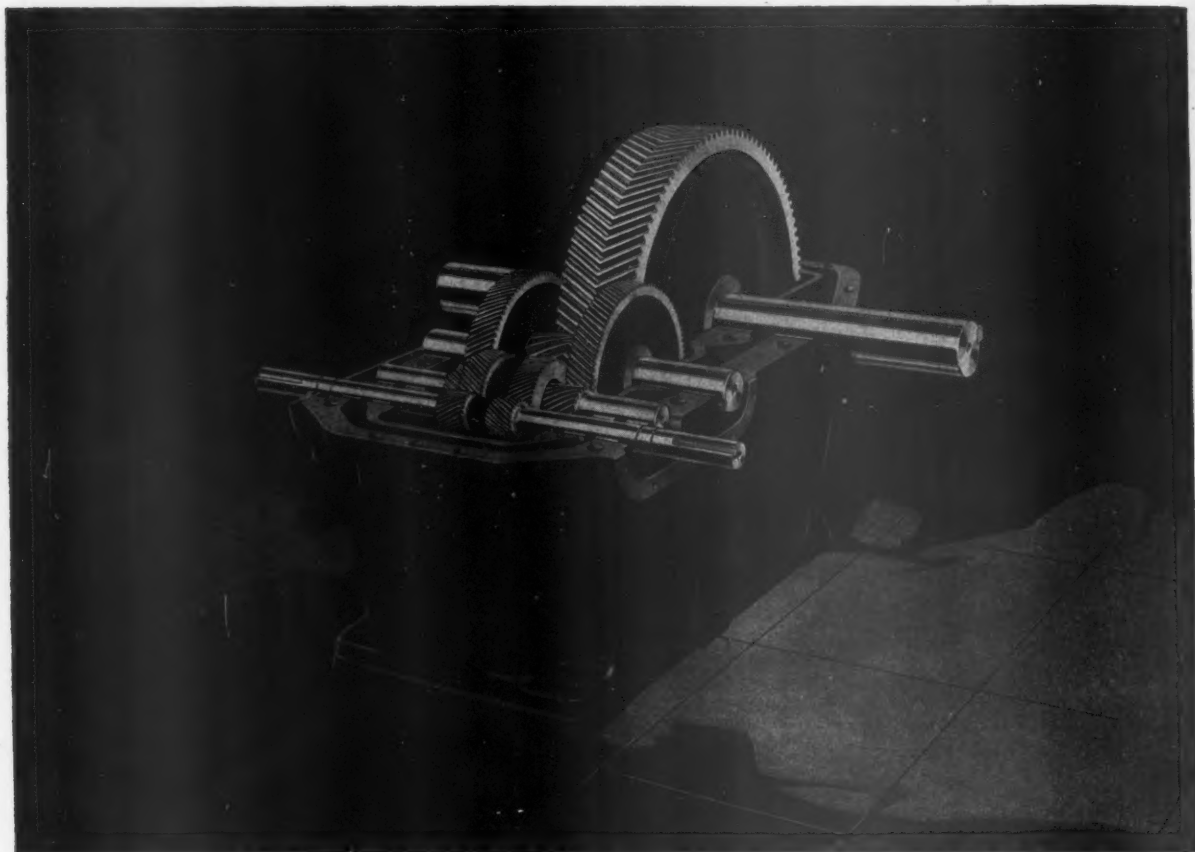
ST. LAWRENCE PAPER  
MILLS, Ltd., Three Rivers,  
Que.

ABITIBI POWER & PAPER  
CO., Iroquois Falls, Ont.

NEW BRUNSWICK INTER-  
NATIONAL PAPER CO.,  
Dalhousie, N. B.



# It Pays to Consult Falk First!



## Falk Speed Reducers Are Vibrationless and Highly Efficient

Falk Speed Reducers are the choice of manufacturers who realize the necessity of skillful engineering for satisfactory speed reducer performance . . . Falk Speed Reducers utilize the famous Falk Herringbone Gears, which are specially cast and cut by a patented process exclusive with Falk—precise uniformity is thus assured . . . Falk Speed Reducers have 100% overload capacity for starting and emergency loads . . . They are dirt-proof, noiseless, free from heat and vibration . . . All wearing parts are interchangeable and renewable . . . There is a Falk Herringbone Gear Speed Reducer for practically every kind of service, — made in standard sizes and ratios, and carried in stock for immediate shipments.

Carried in Stock on the Coast in a wide range of sizes and ratios by

### THE PRESCOTT CO. — Seattle

FALK ENGINEERING & SERVICE OFFICES

San Francisco  
7 Front Street

Los Angeles  
930 Rowan Bldg.

# FALK

## SPEED REDUCERS

### THE FALK CORPORATION — MILWAUKEE

Manufacturers—Herringbone Gears, Speed Reducers,  
Flexible Couplings, Steel Castings and Oil Engines.

*When writing THE FALK CORP., please mention PACIFIC PULP AND PAPER INDUSTRY.*



*The Hawley Pulp and Paper Company, Oregon City, Oregon.  
Courtesy Brubaker Aerial Surveys.*

## 20 Foxboro Liquid Level Recorders for this Pulp and Paper Mill

**A**T the mill of the Hawley Pulp and Paper Company, shown above, there are 20 Foxboro Liquid Level Recorders.

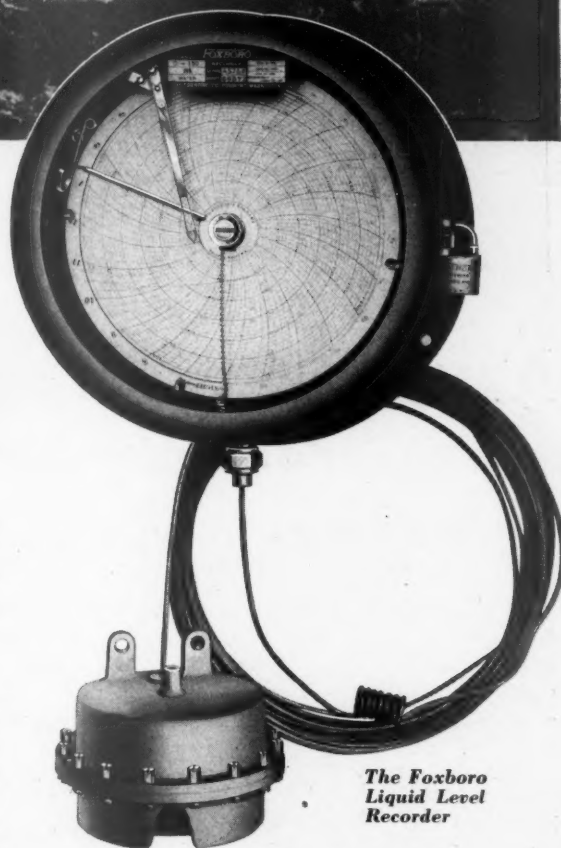
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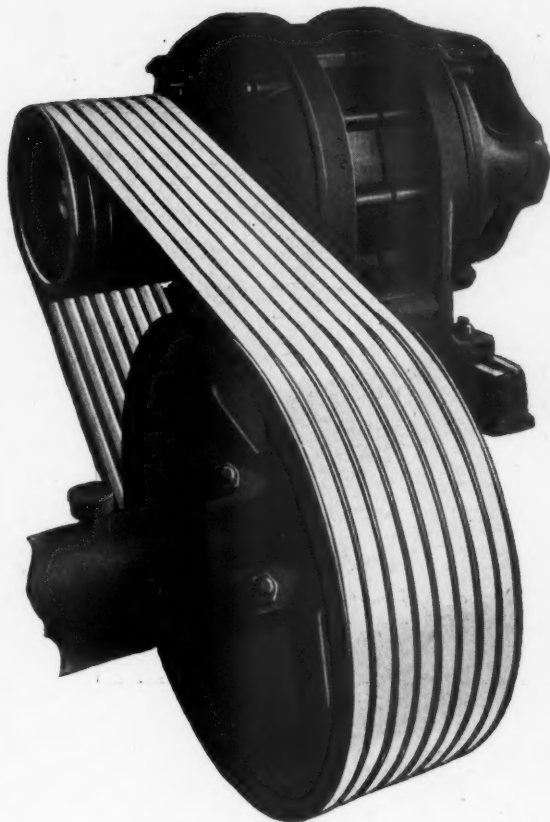
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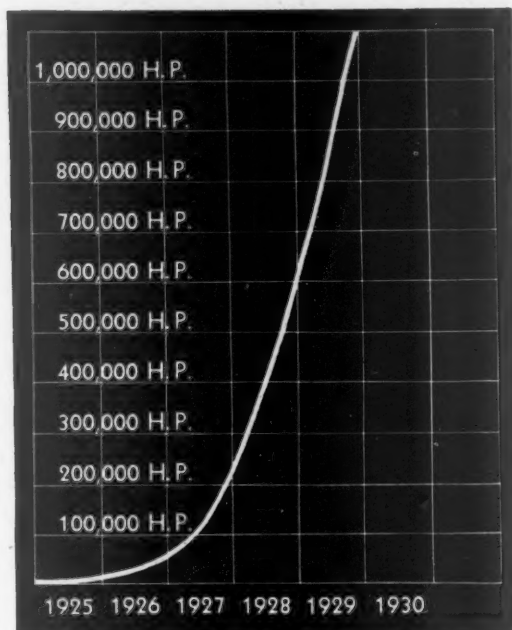


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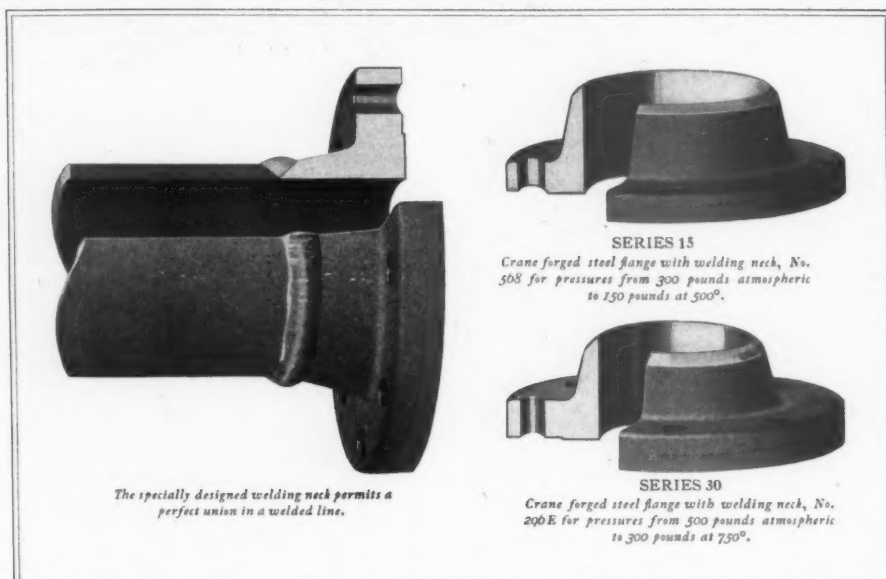


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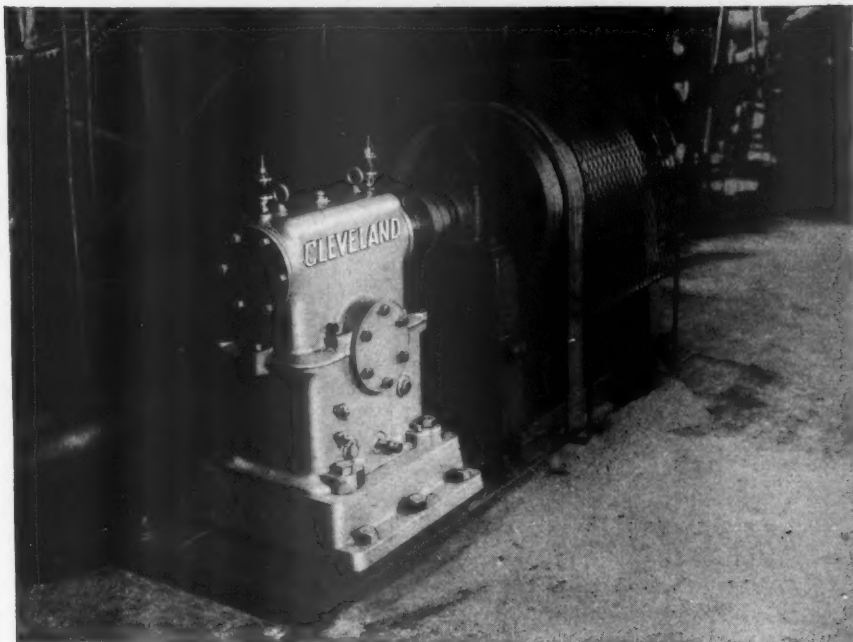
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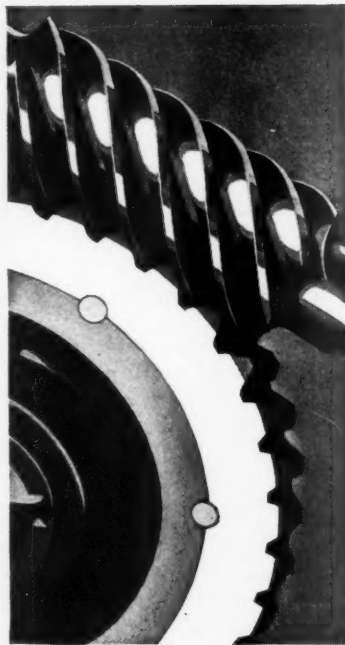
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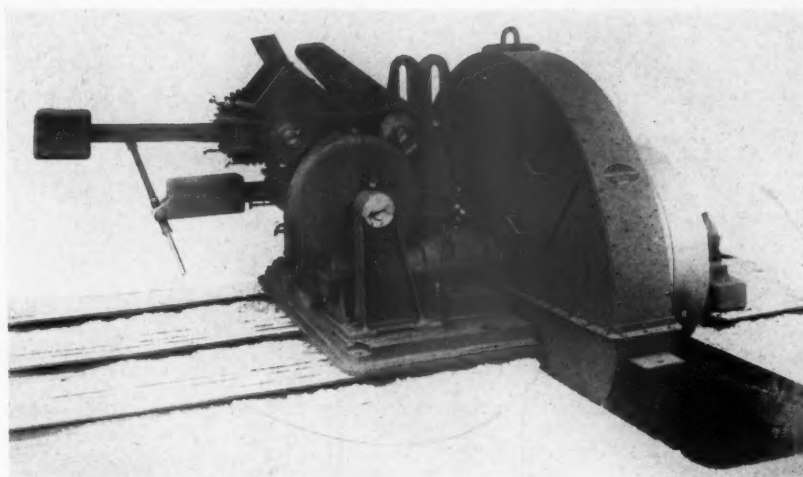
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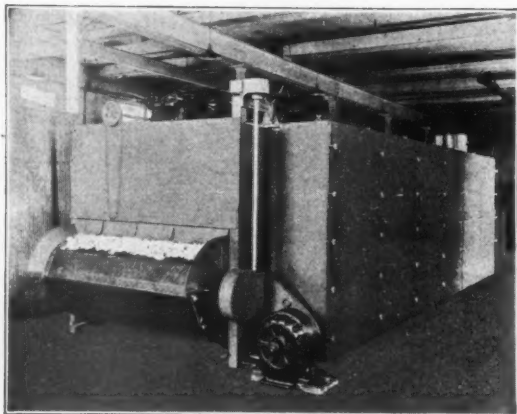


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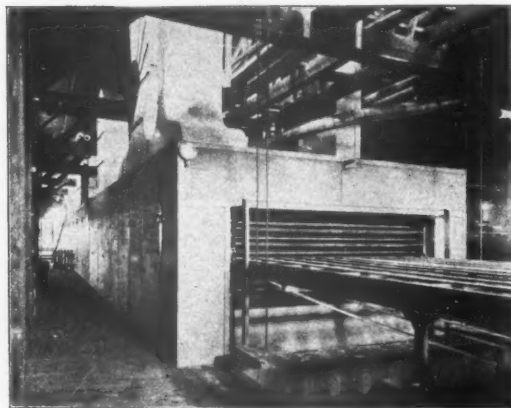
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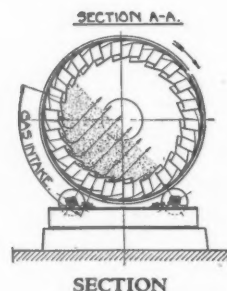
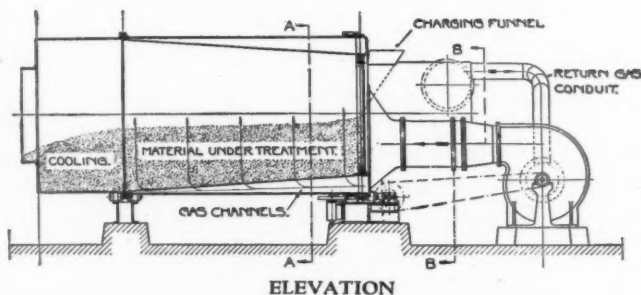
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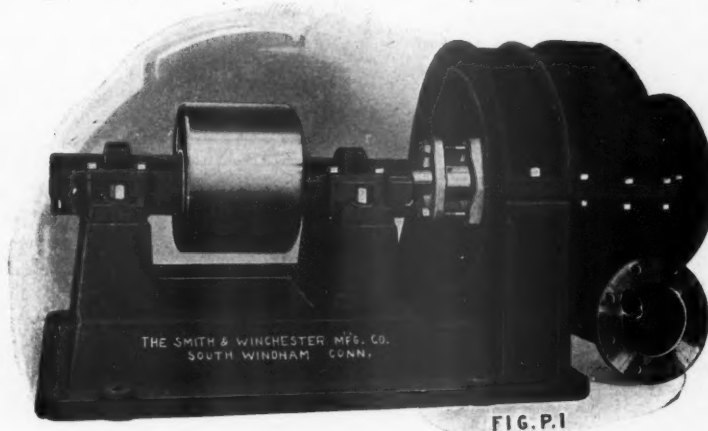
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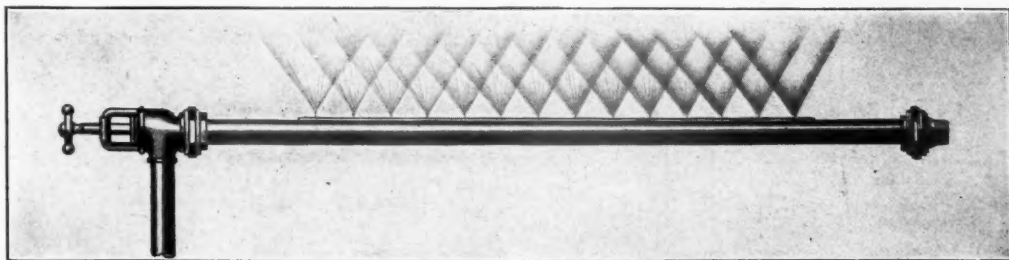
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# Annual Review Number

# PACIFIC PULP and PAPER INDUSTRY

Published by CONSOLIDATED PUBLISHING CO.

SEATTLE, WASH., MARCH 31, 1930

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# Annual Review Number

VOLUME IV

## PACIFIC PULP and PAPER INDUSTRY

NUMBER 4

THE PACIFIC COAST JOURNAL FOR PRODUCERS, CONVERTERS,  
AND DISTRIBUTORS OF PULP, PAPER, AND BOARD.

MILLER FREEMAN, President  
L. K. SMITH, Manager



LLOYD E. THORPE, Editor  
HARLAN SCOTT, Advertising Manager

MARCH 31, 1930

## Reviewing the Pacific Coast

*A summary of major events in the year 1929  
which left their mark in the history of the  
growing pulp and paper industry of the Far West*



BY OBSERVING from a number of viewpoints, one can best measure growth of the pulp and paper industry on the Pacific Coast in 1929. The usual gauge is a computation of additional tonnage capacity installed. This gauge alone, however, is entirely inadequate, particularly so at this time. To be frank, 1929 showed a leveling off of the upward curve so far as new capacity was concerned, altho even on that score there were substantial additions in both pulp and paper. Aside from new tonnage, the growth may be computed in such terms as a definite expansion of markets, improvements in engineering and design, in advance of operating technique, in a consolidation of gains previously made toward that desirable end of establishing this comparatively new industry as a definite entity in the world of pulp and paper manufacture. The aim of this discussion is to point out and summarize those significant developments of the year 1929 which contributed to the industrial advance and which point the trend of the future.

Many of these developments and trends have been deemed worthy of individual and amplified discussion in complete articles elsewhere in this issue.

New tonnage is more fully discussed elsewhere, but a mention here is justified. A number of projects, started prior to 1929, came into production during the year. One project, involving a most extensive rebuilding of one of the largest mills, was semi-completed during the year.

Another project, which may involve eight to ten millions of dollars or more before completion, began definite action just as the year closed. Several lesser additions to capacity were made. But perhaps most important in point of new tonnage in 1929 was the fruition of plans, the beginning of construction, and the semi-completion of what promise to be two of the finest high grade bleached sulphite pulp mills on the continent. Also, during the year, the Pacific Coast industry put into production the widest and fastest bond paper machine and the widest kraft paper machine in the world. These two last named installations are a good criterion of the type of growth that the Coast is experiencing; i. e., second to none.

The expansion in capacity has not been one-sided, running all to one commodity. There is a very noticeable trend toward expanding the grades of pulp and paper manufactured on the Pacific Coast, and, further, a marked progress toward manufacture of the higher grades.

Pacific Coast pulp, for example, is finding its way into the finer paper mills of the East and elsewhere more and more. There is strong evidence, also, that the

manufacture of rayon grade pulp is just around the corner. One big mill launched upon an extensive program that would eliminate newsprint production, diminish the production of the coarser grades and generally raise the output to a higher quality level and wider variety of the more specialized papers. Another mill began the production of high grade sulphite bond paper.

In connection with these two last named mills, it is most significant that a substantial tonnage of each one is destined for a national market. Nor is there any nocturnal back door entry of these markets outside of purely Pacific Coast territory. Both these mills are now making goods which seek national markets, backed by national advertising. This journal has, from the outset, contended that growth of a pulp and paper industry



S. D. BROOKS  
Executive Vice-President  
POWELL RIVER CO., Ltd.

on the Pacific Coast was a matter of national economics, that national and international demands for an increasing tonnage to satisfy consumption, must draw upon the pulp timber resources of the Pacific Coast. Heretofore, this point has been largely a matter of words. In 1929, this theory of expanding markets was substantiated by actual deeds. The matter of markets need only be mentioned here, however, since a more complete discussion of the subject appears on other pages of this issue.

In the same view of widening the range of Pacific Coast products is evidenced a decided tendency on the part of Western organizations to avail themselves of more complete manufacturing profits. Reference is made to the steady expansion in the field of paper converting. Two new paper bag factories were brought into production on the Coast during the year. Others were enlarged. Further, even within the field of paper bags there is a noticeable trend toward refinement of manufacture thru increasing the variety of bags and thru increasing sales of printed bags. In other forms of converted paper products there was substantial progress in enlarging the variety of goods, in creating new uses for paper, in further invasion of paper articles into fields heretofore monopolized by other substances, as for example, wood and tin. It is significant that one large paper mill constructed a new large converting plant in connection; that another mill brought under its management an outside converting plant making a wide variety of specialties. In fact, most of the expansion during the year in the field of converted paper products indicated a decided tendency to coordinate paper manufacture and converting under one man-

agement. There is ample evidence also that the Pacific Coast producers are as aggressive as any in seeking out new uses for paper by studying the proposition from the consumer's angle.

Turn now to the sphere of technical development in the production of pulp and paper. Here is another realm where substantial progress can be credited to this growing Pacific Coast industry. It is at the same time a point of compliment to Pacific Coast operating men.

One of the most important advances of the year occurred within the kraft industry. Reference is here made to the new 120-ton sulphate pulp mill of the Union Bag & Paper Power Corp. at Tacoma, Wash., which began production practically coincidental with the dawn of 1929. A basic motive in the design of this \$2,500,000 mill was the elimination of the characteristic kraft odor which some people find objectionable and which has tended to banish the sulphate mills to isolated communities. The Tacoma mill, with more than a full year of production on a commercial scale behind it, has very ably demonstrated that the kraft mill can today be a respected member in any industrial center, that the odor can be controlled.

#### Kraft Development

At Tacoma, the odorless state is accomplished thru a closed system which collects and condenses the gases and burns those of non-condensable nature. Other points of technical interest in this new kraft mill are the efficient Wagner furnaces with their waste heat boilers, and the continuous causticizing system.

While on the subject of kraft, it is well to mention also that kraft manufacture has witnessed a far greater percentage of growth on the Pacific Coast in the past half dozen years than has any other grade of pulp and paper. Of further interest from the standpoint of Pacific Coast growth, is the fact that Union Bag built the Tacoma pulp mill for the express purpose of supplying their Eastern paper mills due to prohibitive pulping costs on the Atlantic seaboard.

Two other developments in kraft that appear to be just around the corner and of tremendous importance, are the successful bleaching of this pulp with a low bleach consumption and the successful utilization of Douglas Fir kraft pulp for rayon.

#### Vacuum Dryer

Another technical development of note was the inauguration at the West Linn, Oregon, mill of the Crown Willamette Paper Co. of a "noodle" system of groundwood pulp storage. The activating motive in this development was the elimination of high labor costs in the usual lap storage. At West Linn, it is necessary because of seasonal water power, to maintain a much larger groundwood capacity than needed for current paper production requirements. Consequently it is not strange that much study has been given to the groundwood storage problem. In brief, with the new storage method the pulp is collected on an Oliver filter and then blown off the screen in small "noodles" to a storage pile. In drawing from storage the pulp is sluiced, thus eliminating the laborious handling necessary with lap storage.

Another mark of progress during the year for the Coast was the ordering of the first Minton vacuum dryer, to be installed in the new mill of the Olympic Forest Products Co. at Port Angeles for the drying of pulp.

Interesting too, was the inclusion in the specifications of the new Everett, Wash., mill of the Puget Sound Pulp



As illustrated by this recent photograph, the Puget Sound Pulp & Timber Co., is making rapid progress in constructing its new 175-ton bleached sulphite pulp mill at Everett, Washington. Digester building and acid towers are seen at extreme right.

and Timber Co., of two fourdrinier machines of Swedish design for pulp drying.

In the power plants of Pacific Coast mills, there appear to be two very definite trends. One of these is the production of steam at higher pressures and the bleeding off of power with secondary use of the steam at lower pressures for process work. The other trend is somewhat a weighing in the balance of hogged fuel.

In the latter instances there are a number of underlying causes, among which are: rapid growth of the pulp industry in recent years with a consequent creation of a big, new fuel demand, general growth of power consumption for all industrial and domestic uses and coincidental tendency of power companies toward steam electric rather than hydro-electric installations to meet new demands; recent popularization of hogged fuel and sawdust burners for domestic heating plants; greater utilization of sawmill refuse thru diversion for pulp chips. These many new elements have served to set new values upon hogged fuel with an attendant stiffening of prices until a level is reached where other fuels are seriously considered.

#### Hogged Fuel

Further, a siege of cold weather in the winter of 1929-30 of almost unprecedented continuity and severity introduced a new factor in hogged fuel, i.e., continuity of supply. The freeze-up practically tied up the logging camps and lumber mills of the entire Northwest, creating serious problems for many paper and pulp mills and other industries as well. A number of sawmills, under contract to supply fuel, continued to operate under a great handicap. It is quite probable that many new provisions will be injected into hogged fuel contracts that come up for renewal within the next few years. Fuel oil was an industrial life-saver in many cases during the cold snap.

Significant in trend on the steam and power question are two events of the year. The Fir-Tex Insulating Board Co., now building a huge plant at St. Helens, Oregon, to manufacture insulating board, will burn no wood waste. Its boilers will be oil-fired, to produce process steam only. The Puget Sound Pulp & Timber Company's new 175-ton pulp mill at Everett, Wash., will also buy all its power and fire boilers only for process steam.

As an industry, the Pacific Coast mills are acquiring a

growing appreciation for the exact ways of science and are concurrently abandoning the rule of thumb. While this trend toward scientific control in industry is by no means unanimous, there is nevertheless much encouragement. It has been frequently said that greater progress would be made in the direction of science if there were more paper makers and fewer bankers in the paper industry.

#### TAPPI Organized

Nevertheless, during the year, the industry's national organization of technical men, T.A.P.P.I., sent its secretary, R. A. Macdonald, to visit the Coast and assist in the organization of a Pacific Section of T.A.P.P.I., designed primarily to give those members of the organization already employed on the Coast the benefit of periodical meetings within reasonable traveling distance. From a small organization meeting in June, the Pacific Section developed into an unusually successful fall meeting held in Tacoma on October 5. Election of officers at Tacoma resulted in placing R. S. Wertheimer, resident manager of the Longview Fibre Co., Longview, Wash., in the chairmanship. The general opinion was that the marked success of this fall meeting would do much to stimulate further interest in the promotion of the technical side of the industry.

One of the feature speakers at the Tacoma T.A.P.P.I. meeting was C. M. Baker, engineer for the American Paper & Pulp Association, who specializes in waste utilization and stream improvement problems. Mr. Baker's presence at the meeting and his visit to Pacific Coast mills was particularly timely because several Coast mills had had to face somewhat embarrassing charges of stream pollution during the year. There was a general feeling that in matters of stream pollution, the industry could best meet the problems with a united front, and a large part of Mr. Baker's efforts were directed toward that end, together with a seeking of the cooperation, rather than opposition, of other industries, organizations, government bodies, etc. Mr. Baker has given a complete discussion of the Pacific Coast stream pollution problems in other pages of this issue.

The ever recurring question of wood supply claimed its share of pages in the history of the Coast industry in 1929. There were no sharp, radical moves during the year, but the current of events continued to sweep on



until it is certain that the problem of wood supply will in the course of a very few years be completely revised. There is a steady integration of the wood-using industries, a marked trend toward an idea that was scoffed at by leaders in the industry three or four years ago, accepted by them today. Sawmills are turning their waste piles into pulp chips and hogged fuel. New pulp mills are building their own sawmills. Big independent sawmills are seeking to tie in with pulp mills or build their own pulp mills. Loggers are giving serious attention to the salvaging of woods waste. The whole subject of changing trends in the pulpwood supply is so important that it is treated in a separate discussion in this issue.

The opening of new timber regions must be mentioned while on the subject of wood supply. Some important things in this direction occurred in 1929. Most significant of all was the sharp struggle for domination of the greatest remaining virgin stand of pulp timber in the nation, the Western slope of the Olympics in Washington. The struggle developed factions within communities, pitted communities against each other. During the several months that this "battle of the Olympics" was at its height, there was much jockeying for advantage, alliances and counter-alliances, open attacks, subterfuge, and all the tricks of big business for big stakes.

#### Timber Battle

Following the defeat of a measure that would permit the Port of Grays Harbor to build a common carrier railroad at public expense north into the virgin timber country from the Grays Harbor communities, the Union Pacific and Northern Pacific joined hands and announced that they would build 60 miles of new road from Grays Harbor to the Hoh river, providing the Interstate Commerce Commission consented.

This move was heartily condemned by Grays Harbor factions that believed the Olympic territory already to be amply provided with transportation over private logging railroads. At the same time, the camps in the North looked askance at this move on the part of Grays Harbor as virtually staking off much territory that the northern interests felt should be tributary to Port Angeles and Puget Sound. The Port Angeles Western, a common carrier extending some 60 miles West from Port Angeles into rich timber country announced that it would build down to the Hoh. The Bloedel Donovan Lumber Mills, powerful logging and lumber interests, conducting extensive operations in the Northwestern part of the Olympic Peninsula, announced that they would also extend into this virgin territory.

#### Joined Hands

All in all, it was a most interesting situation, with the promise of some major scrapping. But in actual combat the outcome was disappointing, for when the Interstate Commerce Commission held a hearing at Aberdeen on the U. P.-N. P. extension, there was no opposition from any quarter.

The final shakedown showed much joining of hands. The Bloedel-Donovan interests, with Joe Irving, mogul logger, and his Port Angeles Western, joined hands with the Zellerbach group in the Olympic Forests Products Co. to build a new pulp mill and sawmill at Port Angeles. And thus in the north the leading pulp and paper interests affiliated with three of the biggest logging interests on the Pacific Coast, the Merrill & Ring interests representing the third.

At the same time it was revealed that Alex Polson,

leading Grays Harbor logger, held an interest in the Port Angeles railroad, that the Merrill and Ring people owned part of Polson's logging road. Polson was already tied in with the Zellerbach group thru an interest in the Grays Harbor Pulp & Paper Co. at Hoquiam. The sum total of the Olympic struggle seemed to end with the Zellerbach and affiliated interests holding most of the high cards in so far as the Western Olympic timber is concerned.

There is another important timber area in the coastal country of Oregon. This region received its baptism in pulp during the year when a 50-ton pulp mill began production in the Coos Bay country. And the year closed with a number of other likely prospects for pulp mills in the region. The lack of harbors in this region is at present perhaps one of the most serious handicaps to development.

The third great pulp timber area which came one step nearer commercial development during the year is Southeastern Alaska. Following the issuance of temporary pulp timber and power permits in 1927, the permittees have conducted timber cruises and power surveys each season. During the year two cruising parties, one surveying timber and the other studying water power, completed the third season of investigation. Discovery of a new lake near Juneau while aerial mapping brought the development possibilities into a new relief.

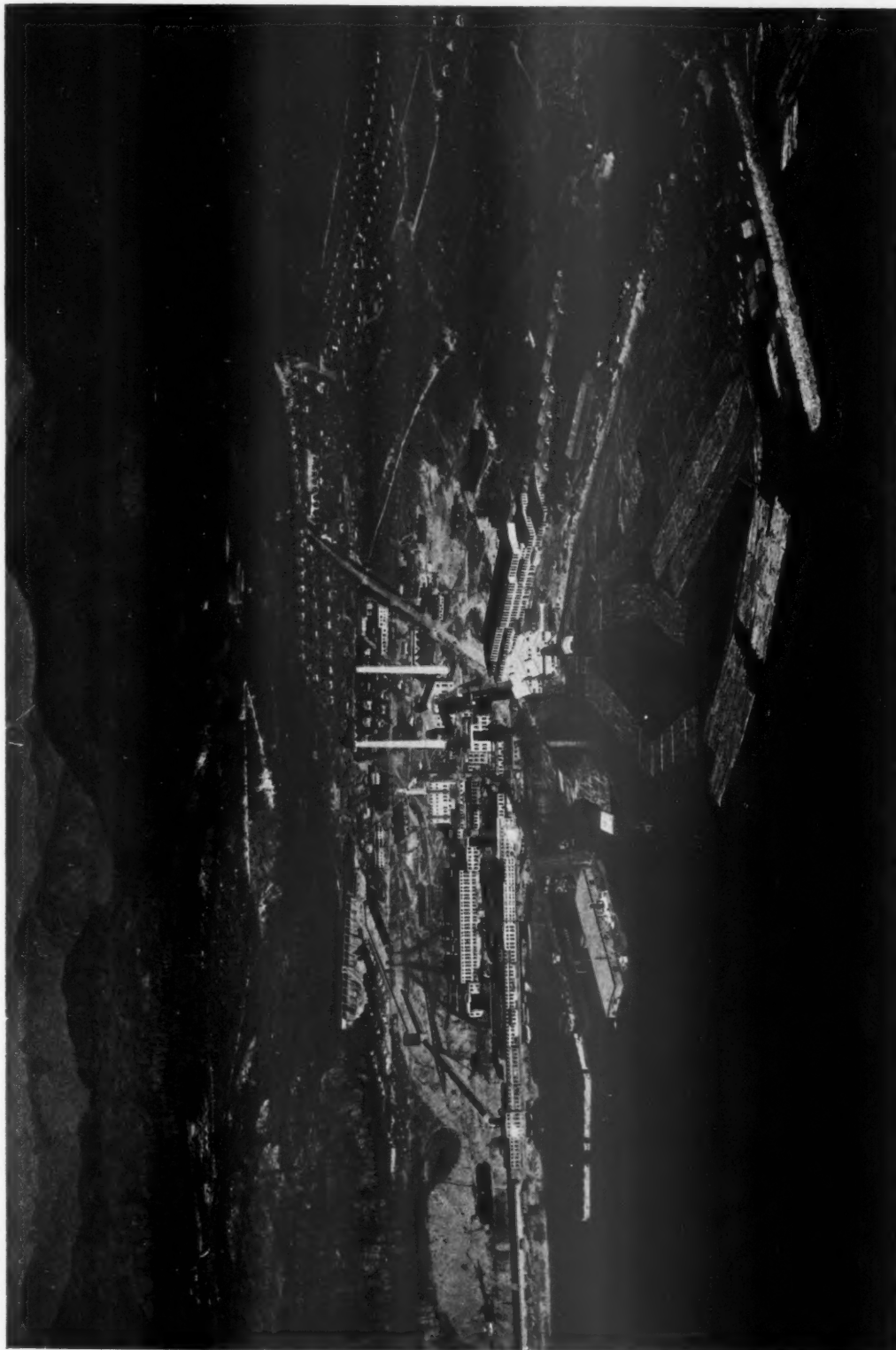
B. F. Heintzlemann, forester in charge of timber sales in Alaska, journeyed to San Francisco headquarters of the two permittees, held closed conferences with the principals with the findings of the work of three seasons before them, and then journeyed on to Washington. Since the extended permits of both projects expire in June 1930, and some further action must then be taken, there is plenty of foundation for the belief that permanent permits for development will be asked for during the present year and that actual construction of paper mills in the northern territory is just around the corner.

#### Mergers

The year 1929 was not spectacular in point of mergers, but there was some activity in this line, nevertheless. In the field of pulp manufacture, the most important move was the organization of the Puget Sound Pulp & Timber Co., bringing into one group the going mills of the San Juan Pulp Manufacturing Co. at Bellingham, and the Fidalgo Pulp Manufacturing Co. at Anacortes, together with a 175-ton pulp mill enterprise at Everett, a sawmill at Clear Lake, Washington, and some railroad properties. The amalgamation gives this organization a total daily tonnage capacity exceeding 300 tons of sulphite pulp, bleached and unbleached.

Among the paper box makers, an important merger was effected in the creation of the Consolidated Paper Box Co., which brought into one organization several independent factories in the San Francisco bay district. Other mergers in this branch of the industry threatened, but nothing to compare with the Consolidated merger resulted.

Here, then, we have summed up the highlights of the growing Coast industry for 1929. Recapitulating briefly, they are: a steady increase in tonnage, a widening of products manufactured, a decided trend toward higher quality products, a determined expansion of markets, notable improvements in operating technique, a radical and rapid changing of wood sources, an opening of new timber regions for pulp manufacture. The wheel of the Pacific Coast pulp and paper industry goes round, and forward. The future is bright.

**POWELL RIVER, BRITISH COLUMBIA**

The Powell River Company, Ltd., now operating a 500-ton news print mill, the largest single enterprise on the Pacific Coast, in 1929 secured rights on new water power and is now spending some \$8,000,000 in expanding its hydro-electric developments and is adding a seventh paper machine, together with many improvements of comparatively less calibre.



# PACIFIC PULP & PAPER INDUSTRY

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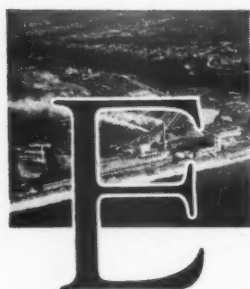
| OREGON                              |             |                    |                    |                    |                    |                    |                    |                    |                    | Wrapping.<br>"East side groundwood mill" operated in connection with West Linn mill.<br>Principally news, but also some sulphite wrapping.<br>Wood fibre insulating board.<br>Daily capacity 250,000 sq. ft.<br>News, Sulphite Wrapping, Lightweight Papers, etc.<br>Sulphite, Bonds, Glassine, Greaseproof, etc.<br>Wrapping. |
|-------------------------------------|-------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--|
| Company                             | City        | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. |  |
| Crown Willamette Paper Co.          | Lebanon     | 60                 | 30                 |                    |                    |                    |                    |                    |                    |  |
| Crown Willamette Paper Co.          | Oregon City | 375                | 90                 |                    |                    |                    |                    |                    |                    |  |
| Crown Willamette Paper Co.          | West Linn   |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Fir-Tex Insulating Board Co.        | St. Helens  |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Hawley Pulp & Paper Co.             | Oregon City | 150                | 85                 |                    |                    |                    |                    |                    |                    |  |
| Oregon Pulp & Paper Co.             | Salem       |                    |                    |                    |                    |                    |                    |                    |                    |  |
| St. Helens Pulp & Paper Co.         | St. Helens  |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Sitka Spruce Pulp & Paper Co.       | Empire      |                    | 50                 |                    |                    |                    |                    |                    |                    |  |
| Spaulding Pulp & Paper Co.          | Newberg     |                    | 75                 |                    |                    |                    |                    |                    |                    |  |
| CALIFORNIA                          |             |                    |                    |                    |                    |                    |                    |                    |                    | Fruit Wrap.<br>Sulphite and Kraft Wrapping.<br>Roofing and Felts.<br>Wrapping and Tissues.<br>Binder Board.<br>Container Board, Tag, etc.<br>Asbestos Paper.<br>Roofing.<br>Roofing and Felts.<br>Roofing and Felts.   |
| Company                             | City        | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. |  |
| California Fruit Wrapping Mills     | Pomona      |                    |                    |                    |                    |                    |                    |                    |                    |  |
| California-Oregon Paper Mills       | Los Angeles |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Certainseed Products Co.            | Richmond    |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Crown Willamette Paper Co.          | Floriston   | 15                 | 35                 |                    |                    |                    |                    |                    |                    |  |
| Fibreboard Products                 | Los Angeles |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Fibreboard Products                 | Stockton    |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Fibreboard Products                 | Los Angeles |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Fibreboard Products                 | Antioch     |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Johns-Manville Corporation          | Pittsburg   |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Los Angeles Paper Manufacturing Co. | Los Angeles |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Paraffine Cos., Inc.                | Oakland     |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Pioneer Paper Co.                   | Los Angeles |                    |                    |                    |                    |                    |                    |                    |                    |  |
| COLORADO                            |             |                    |                    |                    |                    |                    |                    |                    |                    | Fruit Wrap.<br>Sulphite and Kraft Wrapping.<br>Roofing and Felts.<br>Wrapping and Tissues.<br>Binder Board.<br>Container Board, Tag, etc.<br>Asbestos Paper.<br>Roofing.<br>Roofing and Felts.<br>Roofing and Felts.   |
| Company                             | City        | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. | Capacity, 1000 lb. |  |
| Colorado Pulp & Paper Co.           | Denver      | 15                 |                    |                    |                    |                    |                    |                    |                    |  |
| Total daily capacities              |             | 1730               | 1230               | 905                | 720                | 75                 | 1800               | 703                | 515                | 796  |
| Total Pulp Capacity—All Grades      |             |                    |                    |                    |                    |                    |                    |                    |                    | 4,660  |
| Total Paper Capacity—All Grades     |             |                    |                    |                    |                    |                    |                    |                    |                    | 4,168  |

\*Not including 250,000 sq. ft. of insulating board.



# New Tonnage

## A Review of New Construction, Betterments and Additions to the Pacific Coast Industry in 1929



EVERY time a new calendar is hung on the wall it is a strange mortal among us who does not like to tilt back in his chair and begin a finger tabulation of what has happened in the twelve-months just passed into history. The purpose of this article might be said to be to offer its assistance in such recapitulation. Concerning itself, of course, with what has transpired in the way of new mills and major improvements to existing mills in the growing pulp and paper industry of the Pacific Coast.

There was much that happened. There were rumblings of other things to happen, also, but this discussion is limited to only those things material. Much of the same steady pace of growth marked the year 1929 as characterized the several years preceding.

It is of course impossible to draw hard fast lines according to the calendar years when construction programs are spread out over many months, but, taking into consideration all new major construction either completed or actually started within the year 1929 it is found that collectively these programs entailed an outlay of new capital approximating some \$30,000,000. The territory included covers the Pacific Coast states and British Columbia.

### Pulp for Market

This program involved the installation of 27 new digesters which will have a total daily capacity of 695 tons of pulp and 250,000 sq. ft. of woodfibre insulating board. Seven of these digesters were installed as additional units in mills operating. The others are in new mills. The 695 tons of new pulp capacity is divided between 495 tons of sulphite and 200 tons of sulphate or kraft, 15 digesters being required for sulphite and 5 for sulphate. The other six digesters are of the rotary globe type and will be used for the making of insulating board, a product new to the Pacific Coast.

Of this new chemical pulp production 60 tons will be produced by companies operating their own paper mills. The remaining 435 tons will be sold on the pulp market. Half the kraft pulp will go into finished manufactures where produced, the other half is destined to go into paper mills within the same organization but not at the point of pulp production.

Of this total pulp tonnage only 210 tons were actually in production at the close of the year, the remainder representing capacities where construction is under way but not completed. There is some overlapping of these figures with the 1928 review inasmuch as some of the

construction was started during the calendar year 1928.

Two new paper machines were installed and began production during the year, one on fine papers and one on kraft, both the largest in the country for the type of papers on which they are used. A total of 11 machines

### NEW PULP AND PAPER TONNAGE—1929 Programs Affecting Capacities of Pacific Coast Mills

¶ National Paper Products Co., Port Townsend, Wash., completed its second unit, doubling daily capacity to 200 tons of sulphate pulp and a like amount of test liner and kraft paper, the latter produced on the widest kraft paper machine now in operation.

¶ Grays Harbor Pulp & Paper Co., Hoquiam, Wash., completed paper mill unit equipped with widest and fastest bond paper paper machine, having daily capacity of 50 tons, and began paper production under supervision of Hammermill Paper Co., of Erie, Pa.

¶ Rainier Pulp & Paper Co., Shelton, Wash., installed a new digester and additional steam and power capacity, raising daily tonnage to 170 tons of bleached sulphite.

¶ Crown Willamette Paper Co., began work on \$4,000,000 general improvement program at Camas, Wash., mill to discontinue news print for greater tonnage of bleached sulphite specialties. Program includes three new paper machines, new digester, enlarged bleaching plant, converting plant and other auxiliaries.

¶ Spaulding Pulp & Paper Co., Newberg, Ore., increased daily capacity to 75 tons unbleached sulphite with installation of new digester.

¶ Olympic Forest Products Co., Port Angeles, Wash., began construction of first 150-ton unit of what will ultimately be 500-ton high grade bleached sulphite pulp mill with 1,000,000 ft. b.m. sawmill in connection.

¶ Puget Sound Pulp & Timber Co., Everett, Wash., began construction of 175-ton high grade bleached sulphite pulp mill, with sawmill in connection.

¶ Powell River Co., Ltd., Powell River, B. C., began construction on huge program which will provide new power plant transmission line, additional sulphite and ground-wood pulp capacity, and new news print machine, aiming at eventual 1,000-ton daily capacity.

¶ Pacific Mills, Ltd., Ocean Falls, B. C., largely completed extensive program of bettering hydro-electric and steam power plants, together with new groundwood pulp equipment and screen rooms.

¶ Westminster Paper Co., Ltd., New Westminster, B. C., destroyed by fire during year, began rebuilding on larger scale.

¶ Longview Fibre Co., Longview, Wash., installed grinder to manufacture 20 tons of groundwood pulp daily.

¶ Pacific Straw Paper & Board Co., Longview, Wash., installed groundwood pulp equipment and made other general improvements.

¶ Fir-Tex Insulating Board Co., St. Helens, Ore., began construction on Pacific Coast's first insulating board mill, to cost about \$2,000,000 and to produce 250,000 sq. ft. of board daily.

¶ Sitka Spruce Pulp & Paper Co., Empire, Ore., completed 50-ton unbleached sulphite pulp mill.

¶ Vancouver Kraft Co., Ltd., Port Mellon, B. C., temporarily suspended work shortly before completion of 100-ton sulphate pulp mill.

must be scheduled for 1929, however. Some of these are now presently being installed, while others are on order for installation that may run into 1931. Three of these machines are for pulp drying only. Three, while representing two new machines and one replacement, do not actually represent entirely new tonnage because their installation is made in a mill which is changing its type of product, going to higher grades of paper, where more machines are needed for an equal tonnage.

In one case a mill destroyed by fire during the year will be rebuilt on a larger scale.

As for groundwood capacity, two mills installed a total of three grinders to meet individual requirements while a third made a major addition of five 3-pocket grinders for its news print requirements. In all cases the new grinders installed have electrical drives. Another mill which just began a big construction program as the year closed will add 13 new grinders for news print.

In more detail much can be said with respect to the programs carried out at the several mills.

\* \* \*

ONE of the major projects was the completion of the National Paper Products Company's mill at Port Townsend, Wash. This division of the Crown Zellerbach Corporation began construction in 1927 on a 100-ton mill for the manufacture of sulphate pulp and test liner. The first unit was duly finished and began production late in 1928, but before that time the management had resolved to double the original capacity. Consequently, before the first unit was completed work was already in progress for the second unit of similar size.

The pulp department of the second unit is essentially a duplicate of the first unit. In all, the Port Townsend mill has six digesters of the stationary type. The second unit, however, diverts its pulp to a new 251-inch kraft paper machine which is rated the biggest and fastest of its kind on this type of paper.

As it stands now the completed mill is composed of two equal units. Straight line production is a feature of the construction. The plant is located on tidewater and has its own docks capable of accommodating deep draft vessels. There is also a rail spur.

A significant feature is that it has no wood room of its own but draws its wood in the form of chips from a company operating a number of chipping plants in connection with sawmills, converting the refuse of these lumber mills to good commercial use. Both chips and hogged fuel, used under the Port Townsend boilers, come to the National Paper Products Co. in big scows and are unloaded with grab buckets and overhead conveyor systems direct to fuel or chip storage.

At Port Townsend diffuser tanks are dispensed with and the cooked pulp is blown into a large cyclone—one for each set of three digesters—and washed on Oliver brown stock washers. The usual complement of beaters, jordans and other auxiliaries are employed to prepare the raw stock for the machines.

The 251-inch machine which began production in 1929 has a Beloit fourdrinier end and Bagley & Sewall dryers. The board machine is a Black-Clawson cylinder type. Machine operations are directed from the second floor and auxiliaries are installed on the first, or ground, floor.

On the cylinder machine the Westinghouse Electric & Manufacturing Co. has installed a complete sectional drive from cylinder moulds to rewinders. This drive

dispenses with the older method of using the felts as drive belts and is able to effect a number of economies. It is the first drive of its kind to be installed.

The Port Townsend mill is self-sufficient in its steam and electrical power requirements, developing steam at 375-lb. pressure and skinning off the power in extraction type condensing turbo-generators before delivering the heat to process work. Incidentally, it might be mentioned here that the trend is now quite general toward high pressure steam in the power plants of Pacific Coast mills.

Construction and design of the National Paper Products Company's mill at Port Townsend was under the supervision of V. D. Simons, assisted by H. N. Simpson as resident engineer.

\* \* \*

AS the year closed engineering and construction crews working under the direction of Hardy S. Ferguson, consulting engineer, were making rapid progress on the building of a new 175-ton high grade bleached sulphite pulp mill at Everett, Wash., for the Puget Sound Pulp & Timber Co. The company itself came into being during the year, bringing into one organization the allied pulp plants of the San Juan Pulp Manufacturing Co. at Bellingham, Wash., and the

#### New Digesters Installed or Ordered in 1929

Rainier Pulp & Paper Co., Shelton, Wash., one, additional, sulphite.

National Paper Products Co., Port Townsend, Wash., three, additional, sulphate.

Crown Willamette Paper Co., Camas, Wash., one, additional, sulphite.

Sitka Spruce Pulp & Paper Co., Empire, Ore., two, new, sulphite.

Puget Sound Pulp & Timber Co., Everett, Wash., five, new, sulphite.

Olympic Forest Products Co., Port Angeles, Wash., four, new, sulphite.

Powell River Co., Ltd., Powell River, B. C., one, additional, sulphite.

Vancouver Kraft Co., Ltd., Port Mellon, B. C., three, new, sulphate.

Fir-Tex Insulating Board Co., St. Helens, Ore., six, new, insulating board.

Spaulding Pulp & Paper Co., Newberg, Ore., one, additional, sulphite.

RECAPITULATION: Sulphite digester capacity added 505 tons, kraft 200 tons, insulating board, 250,000 sq. ft.

Fidalgo Pulp Manufacturing Co. at Anacortes, together with various sawmill, railroad and timber properties.

The site selected is on the Everett waterfront where the mill will have its own deep water docks and main-line rail connection. The City of Everett showed its willingness to cooperate with the new enterprise by voting bonds for a new industrial water system.

A point of interest in connection with the new Puget Sound Pulp & Timber Co. mill is that it will develop only its necessary process steam, depending upon the Puget Sound Power & Light Co. for its electrical requirements.

The mill is expected to begin production during the early summer of 1930. It embodies many notable features. The management has departed from ordinary

practice in a number of ways and has spared no efforts to build a mill that is as thoroughly modern as engineers know how to make it.

One of the major deviations in the Everett mill is the building of a sizeable sawmill within the layout to operate strictly as a plant utility for breaking down large and small logs under pulp mill supervision to uniform cants to insure production of uniform chips.

The trend in the Everett mill is towards more, but smaller digesters. There will be five of 19-ton capacity, the purpose being to have ample facilities for cooking from 14 to 16 hours. Brown stock chests will have sufficient capacity to permit the contents of all five digesters to be blended, this measure being designed as one step in maintaining a uniform product.

The Everett mill will have an unusually large screen capacity and will screen both before and after the two-stage bleaching process, and before going to the two drying machines. These latter are the fourdrinier type and have pre-drying cylinders to permit the drying of a relatively thin sheet at fairly high speeds and low temperatures.

Nothing is being spared to make the buildings thoroughly modern in type. Steel, concrete and brick are used and the whole plant is so laid out that doubling of capacity can easily be accomplished without disturbing operations.

The company's holdings will permit control of operations from logging to finished pulp—and it should be mentioned here that the Everett mill plans to use only

forest wood, in contrast to its unbleached sulphite mills at Bellingham and Anacortes, where considerable amounts of sawmill waste are used.

It is the aim of President Ossian Anderson to make at Everett the highest grades of pulp in a mill as modern as the best engineers know how to build it.

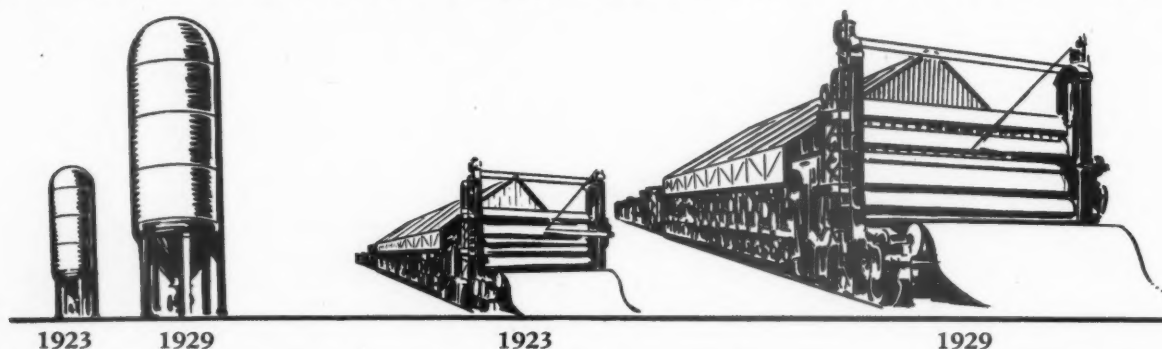
**I**N September, 1928, the Grays Harbor Pulp & Paper Co. completed a 150-ton bleached sulphite pulp mill at Hoquiam, Wash., in the well known Grays Harbor timber country. Even before completion, work was started on a 50-ton bond paper mill unit adjoining the pulp mill and production began in this department in the late summer of 1929.

Work began at Hoquiam under the direction of the Grays Harbor Pulp Co., comprising essentially all Western interests, but subsequently the Hammermill Paper Co. of Erie, Pa., purchased a substantial interest and the name was changed to the Grays Harbor Pulp & Paper Co. The Hammermill interests were largely responsible for the design of the paper mill unit, and paper production is under their control through a subsidiary company. The paper mill is producing a new brand, "Management Bond—A Hammermill Product" which is now being nationally advertised.

The new paper mill unit can load from its own finishing room and warehouse into deepwater vessels or transcontinental rail cars.

A single building 70x700 feet, adjacent, and at right

### COMPARATIVE GROWTH OF PACIFIC COAST PULP AND PAPER INDUSTRY—1923-1929



Total Daily Capacity All Grades of Pulp

1923—2,045 tons

1929—4,660 tons. Increase: 122%

Total Daily Capacity All Grades of Paper and Board

1923—2,056 tons

1929—4,168 tons. Increase: 98%

### WOODPULP PRODUCTION—1921-1928

Pacific Coast States and British Columbia

|                       | 1921    | 1923    | 1924    | 1925    | 1926    | 1927    | 1928    | 1929*   |
|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                       | Tons    | Tons    | Tons    | Tons    | Tons    | Tons    | Tons    | Tons    |
| Washington            | 95,161  | 136,943 | 159,539 | 161,858 | 199,164 | 268,349 | 349,107 | 410,000 |
| Oregon and California | 124,494 | 162,653 | 149,894 | 160,736 | 178,841 | 200,869 | 213,407 | 215,000 |
| British Columbia      | 164,746 | 217,076 | 216,243 | 230,733 | 259,504 | 296,253 | 310,961 | 279,638 |
| Total Pacific Coast   | 384,401 | 516,672 | 525,676 | 553,327 | 637,509 | 775,471 | 873,475 | 904,638 |

Source—U. S. figures from U. S. Dept. of Commerce, Bureau of Census; B. C. figures from Dept. of Lands, Forest Branch; and Dominion Bureau of Statistics.

\*1929 figures are estimates based on operations of previous years, adjusted to include increased capacity of the industry arising through new or enlarged mills adding their production in 1927 and 1928, taking into consideration the month of the year the new units began operations.

Note: Forced shutdown due to power shortage accounts for decreased production in British Columbia in 1929.





Brubaker Aerial Surveys, Portland

This recent view gives an idea of the extensive improvement program, carried out at a cost of several millions of dollars, and now nearing completion, at the Camas, Washington, mill of the Crown Willamette Paper Co.

angles, to the pulp mill, houses the paper mill. This building comprises three main departments: the beater room, machine room, and finishing room. In construction the building follows the substantial structures of reinforced concrete, steel, and glass favored by the V. D. Simons engineering organization, which in addition to the Grays Harbor mill, has constructed a number of other mills for interests affiliated with the Hoquiam organization.

All steam, power, water and pulp requirements of the paper mill are piped or wired from the pulp mill. Process steam is first run through extraction type turbo-generators.

The beater room has eight beaters specially designed for rapid circulation of high density stock, two jordans, and ample stock storage chests to give a measure of flexibility.

The paper machine is said to be the widest and fastest yet constructed to operate on high grade sulphite bond papers. It has a 202-inch wire and is designed to operate at speeds up to 1,000 feet per minute. Beloit built the fourdrinier end and Bagley & Sewall the dryer end, and over all the machine incorporates a number of new and outstanding features.

Among them are: use of Timken roller bearings throughout; silent, enclosed gears of small diameter on the drive; 40 carefully finished and balanced dryer rolls of 60-inch diameter.

Refinements are also to be found on the calendar, reel and rewinder, these being designed in general to save wear on the machines, further accuracy of control, and to speed operations.

The Westinghouse sectionalized electric drive applied to the Grays Harbor machine represents a refinement in speed control, and its design reflects the end result sought.

Management of the Grays Harbor Pulp & Paper Co. is under the general direction of W. S. Lucey, an engineer with many years of Hammermill training behind him.

\* \* \*

**A**N entirely new district of the Pacific Northwest was opened to pulp manufacture during the year when the Sitka Spruce Pulp & Paper Co. began production in December in a new 50-ton unbleached sulphite mill. It opens the Oregon Coast country, a region heavily endowed with pulp timber.

The Sitka mill, built under the direction of Superintendent J. B. Wilt and E. T. Bellew, follows a noticeable trend in Pacific Coast mill practice in that it incorporates a sawmill. President C. McC. Johnson of the Sitka Spruce Pulp & Paper Co., is an old time lumberman.

From the company's holdings, which run about 95% Sitka spruce, the logs are put through a sawmill having a capacity of 130,000 f.b.m. per 8-hour shift and the clears are taken out. The other parts of the logs are routed through a wood room which works up all the suitable material into pulp chips and concentrates all refuse for the boilers.

The mill has its own docks at Empire, on Coos Bay, over which it can load lumber and pulp aboard ocean freighters or receive incoming supplies.

Buildings are of sturdy mill type construction, with



concrete employed for footings and in the acid plant.

In the pulp mill proper the acid plant follows the usual G. D. Jennsen two-tower design. There are two Willamette digesters 16x51 feet in size. Pulp is dried on a 96-inch cylinder dryer, and is cut into sheets and baled under hydraulic presses for shipment.

Superintendent Wilt, who has served an apprenticeship in the sulphite pulp industry approximating a quarter century, has incorporated in the design of the Sitka mill a number of his own ideas, including a silent roller cam screen, and specially fitted blowpits.

The mill develops its own steam requirements, but draws its electrical power from a public utility.

\* \* \*



J. B. WILT

Superintendent  
SITKA SPRUCE  
PULP & PAPER CO.

**P**ULP and paper has been manufactured at the town of Camas, Wash., for many years by the present Crown Willamette Paper Co., division of the Crown Zellerbach Corporation and the various predecessors that have come down to the present through a series of mergers. In the history of the mill, however, perhaps no more important program of general improvement has ever been undertaken than was launched in 1929.

Summed up, when the \$4,000,000 program, moving rapidly forward at the close of the year, is completed it will mean that the Camas mill will cease to be a news print producer and that other tonnage of fruit and groundwood filled tissue, sulphite and kraft wrapping, and converted bag tonnage will be increased. The mill will also enter the field of bleached specialties and personal utility papers.

The plant improvements include a new band-saw mill, chipping and chip handling facilities, an additional sulphite digester, a 100-ton daily bleachery, three new paper machines, rebuilding four of the present nine paper machines, a greatly enlarged converting plant, additional water filtration equipment, and a new steam electric generating plant.

The wood mill will follow a trend in Pacific Coast practice of reducing logs to cants and will be capable of handling logs up to 8 feet in diameter. Six chippers with a pair of vibratory screens for each will handle the reduction and sizing of chips. Great emphasis will be placed on getting high quality chips for the bleached papers, while the rejects will be diverted to the kraft mill.

The new digester is to be hooked up with two of the other digesters so that special cooking of an easy bleach-

ing stock may be accomplished separately from cooks going into unbleached papers.

A new three-story bleachery is being built with all necessary apparatus for single stage bleaching of from 100 to 150 tons of stock daily.

Extensive slush pulp storage is designed to eliminate lap storage.

In the machine rooms a detailed program has been laid down for each machine. Machines No. 1 and No. 2 are being rebuilt to produce 10-lb. tissues at higher speeds. No. 3 machine is displaced by a new 137-inch straight fourdrinier for high-speed production of fruit wrap and tissue. The machine will be driven from a line shaft, having its own electric motor, with each section capable of being controlled from the front of the machine through pushbuttons and magnetic clutches.

Machine No. 5 is to be equipped with a removable fourdrinier and otherwise improved to operate at higher speeds on bleached sulphite specialties. Machine No. 6 is being rebuilt to produce an increased tonnage of kraft wrapping papers and bag stock.

A new No. 10 machine with a fourdrinier wire 132 inches wide is being installed to produce machine glazed, plate marked and felt striped specialties of medium to light weight paper both sulphite and kraft. A new No. 11 machine is being installed to turn out 25 tons of toilet tissues daily.

In switching over from news to higher grade specialties much auxiliary equipment is to be added. Major items here will include the addition of 8 new 2,000-lb. beaters for kraft papers, several new jordans, screens, condensate removal and moisture control systems.

One of the significant points in the Camas program is a decided widening of activities in the paper converting department. The Camas mill today is one of the most complete plants on the Coast, and has a larger payroll than any other single Pacific Coast mill. Present extensions into the converting field will further elevate this position of leadership.

#### Steam Plant

Present steam electric power at the Camas mill is rudimentary, but the improvement program contemplates significant changes in this department of the plant. Existing steam engine drives will be retained but no more will be added. The power plant will follow the existing trend toward high pressure steam and electrification, and contemplates ultimately the addition of new boilers with two double automatic extraction turbo-generators designed to bleed steam at process pressures and exhaust to vacuum. The mill at present relies on a public utility for its major electrical requirements.

First announcement of the big Crown Willamette Paper Co. program was made early in 1929 and actual work started a few months later. The year closed with the construction crews "right up to their middle." The design and carrying out of the changes are under the supervision of V. D. Simons, with H. A. Simons acting as resident engineer.

\* \* \*

**T**HE Pacific Straw Paper & Board Co. added to its buildings at Longview during the year, increasing its warehouse facilities, pumping and filtering equipment, enlarged its line of products and added a grinder to supply its own groundwood pulp requirements.

\* \* \*

**G**ROUNDWOOD pulp requirements of the Longview Fibre Co. are now being filled at home, due to the installation of two 3-pocket, electrically driven grinders during the year 1929. This mill at Longview, Wash., began production late in 1927 and produces approximately 120 tons of sulphate pulp daily, converting the same into kraft board and m.g. wrapping.

A significant feature of the Longview mill is that it operates exclusively on Douglas fir mill waste from adjoining sawmills with the exception of some hemlock

for the m.g. papers. Another important move during the year was the establishment and enlargement of a paper bag factory within the mill.

\* \* \*

**F**IRE completely destroyed the plant of the Westminster Paper Mills, Ltd., at New Westminster, B. C., during the summer of 1929. Out of the ashes is rising a somewhat revised organization and a bigger, better mill, to be built in two units and to cost in all about \$2,000,000.

### PULP WOOD CONSUMPTION—1921 - 1929

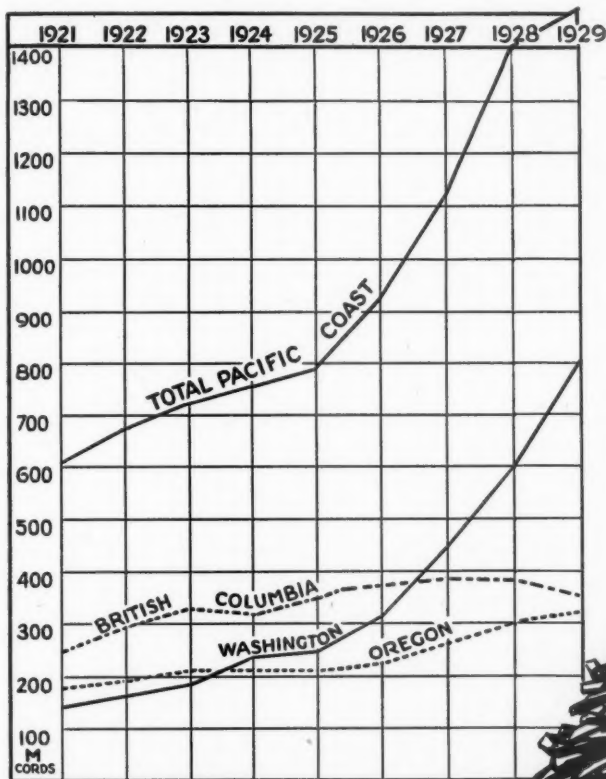
Pacific Coast States and British Columbia

|                       | 1921<br>Cords | 1923<br>Cords | 1924<br>Cords | 1925<br>Cords | 1926<br>Cords | 1927<br>Cords | 1928<br>Cords | 1929†<br>Cords |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|
| Washington            | 149,699       | 191,731       | 230,299       | 241,150       | 305,787       | 455,664       | 651,657       | 800,000        |
| Oregon and California | 192,869       | 205,199       | 205,968       | 209,349       | 232,989       | 267,233       | 308,264       | 325,000        |
| British Columbia*     | 203,000       | 267,000       | 266,000       | 284,100       | 318,500       | 364,000       | 383,008       | 350,000        |
| Total Pacific Coast   | 545,568       | 663,950       | 702,267       | 734,599       | 857,276       | 1,076,899     | 1,342,929     | 1,475,000      |

Source—U. S. figures from U. S. Dept. of Commerce, Bureau of Census; B. C. figures from Dept. of Lands, Forest Branch; and Dominion Bureau of Statistics.

\*British Columbia figures prior to 1928 are not shown separately and are estimated on basis of 1.23 cords of wood consumed per ton of wood pulp produced.

†1929 figures are estimates based on operations of previous years, adjusted to include increased capacity of the industry arising through new or enlarged mills adding their production in 1928 and 1929, taking into consideration the month of the year the new units began operations.



### GROWTH OF PULPWOOD CONSUMPTION

in the Pacific Coast States  
and British Columbia

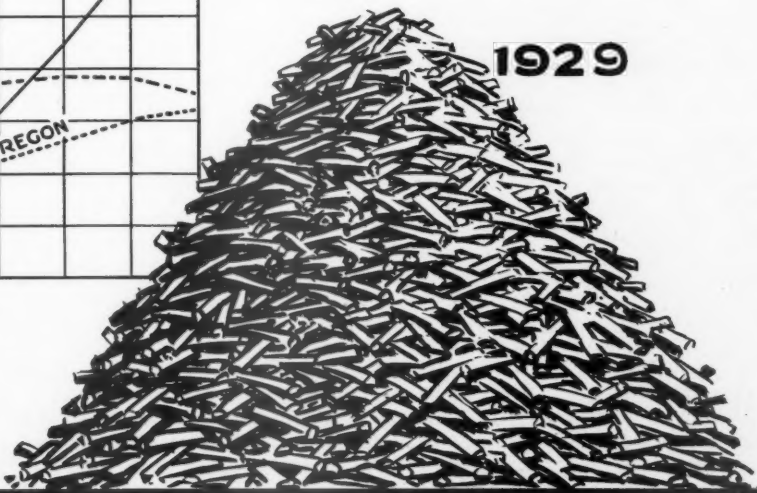
— 1921 to 1929 —

U. S. statistics from U. S. Department of Commerce; Canadian statistics from B. C. Department of Lands, Forest Branch. Figures for 1929 are estimates based on operations of previous years and additional capacities coming into production in 1928 and 1929.



1921

608,000 CORDS



1929

1,475,000 CORDS

The reconstructed mill will have more modern equipment and will be prepared to produce a much wider range of products than the old plant. In the matter of diversified production it is said the mill will be unique in Canada.

The old Yankee machine, destroyed by fire, is being replaced by a combination machine of twice the size, to produce a line ranging from lightest tissues to heaviest wrapping.

The first unit will include a two-story machine room 60x230 feet and a three-story finishing building 100x160 feet.

\* \* \*



A. B. MARTIN  
President  
PACIFIC MILLS, Ltd.

**F**OLLOWING a water shortage which seriously curtailed production at Ocean Falls, B. C., in the winter of 1928-29, Pacific Mills Ltd., launched an extensive program of improvement designed generally to improve the power situation by strengthening the hydro-electric development and revising the steam plant, and second, to enlarge and improve the mill's ground-wood pulp mill.

The existing 29 water-driven 3-pocket grinders were supplemented by the addition of 5 more, but with electrical drive. At the same time the old grinder room was replaced by a new concrete structure and important additions and improvements were made in the ground-wood screen equipment.

A new reinforced concrete chemical pulp screen building, 54x126 feet was also added, adjoining the groundwood screen room, to serve better the sulphate and sulphite pulp mills of the plant.

Six new beaters were added to the kraft mill.

A new Stirling type boiler operating on a pressure of 390 lbs. was also installed, equipped to fire both oil and hogged fuel. Improved methods of firing hogged fuel and a number of important steam economies were built into the new boiler house. At the same time a 3,750 KVA turbo-generator unit was installed to operate on high pressure steam and divert lower pressure to process work.

V. D. Simons of Chicago had charge of the development.

\* \* \*

**I**MMEDIATELY following its successful quest to the provincial government for permission to develop the Lois River water powers, the Powell River Co., Ltd., now operating a 500-ton news print mill at Powell River, B. C., the largest single unit on the Pacific Coast, began work on a program that may eventually raise the mill's capacity to 1,000 tons per day.

The immediate program will involve an expenditure of not less than \$6,000,000. It includes the building of a dam and hydro-electric plant on the Lois River to generate 18,000 h.p., a 15-mile transmission line to Powell River, an additional sulphite digester, 13 new grinders for mechanical pulp, the addition of one new 226-inch paper machine, and other auxiliary improvements.

At Powell River the company has built an immense institution comprising a complete power plant, news print mill and townsite. At present some 50,000 h.p. is developed hydro-electrically. The Lois River development will eventually bring this up to 90,000 h.p.

As the year closed, work was already going forward on the new dam and transmission line, and first work on the improvements at the mill itself had been started. Powell River Company's own engineering force is carrying out the principal work under the direction of Robert Bell-Irving, mill manager.

\* \* \*

**S**HELTON, Washington, witnessed first production at the 135-ton bleached sulphite pulp mill of the Rainier Pulp & Paper Co. in the summer of 1927. Since then the mill has operated steadily. During the past summer two changes were made to further increase and more perfectly balance production.

To secure greater steam capacity than available in the joint steam plant operated adjacent to the two adjoining sawmills, and to effect certain power economies, additional boiler capacity was installed and with it a bleeder-type turbine to take off surplus power.

At the same time a fourth digester was added in the pulp mill to increase the cooking capacity, thus in effect permitting other parts of the mill to take on the heavier loads they were capable of handling.

\* \* \*

**O**NE of the most important developments of the year was the formation of the Olympic Forest Products Co. and the beginning of construction at Port Angeles, Wash., on the first 150-ton unit of what will ultimately be a 500- to 600-ton high grade bleached sulphite pulp mill.

This project demonstrates the strong trend on the Pacific Coast toward integration of sawmills and pulp mills, for it will include a modern sawmill capable of cutting 1,000,000 f.b.m. per day. Work on the plant began in the fall of 1929 and first production is scheduled to begin sometime in the summer of 1930.

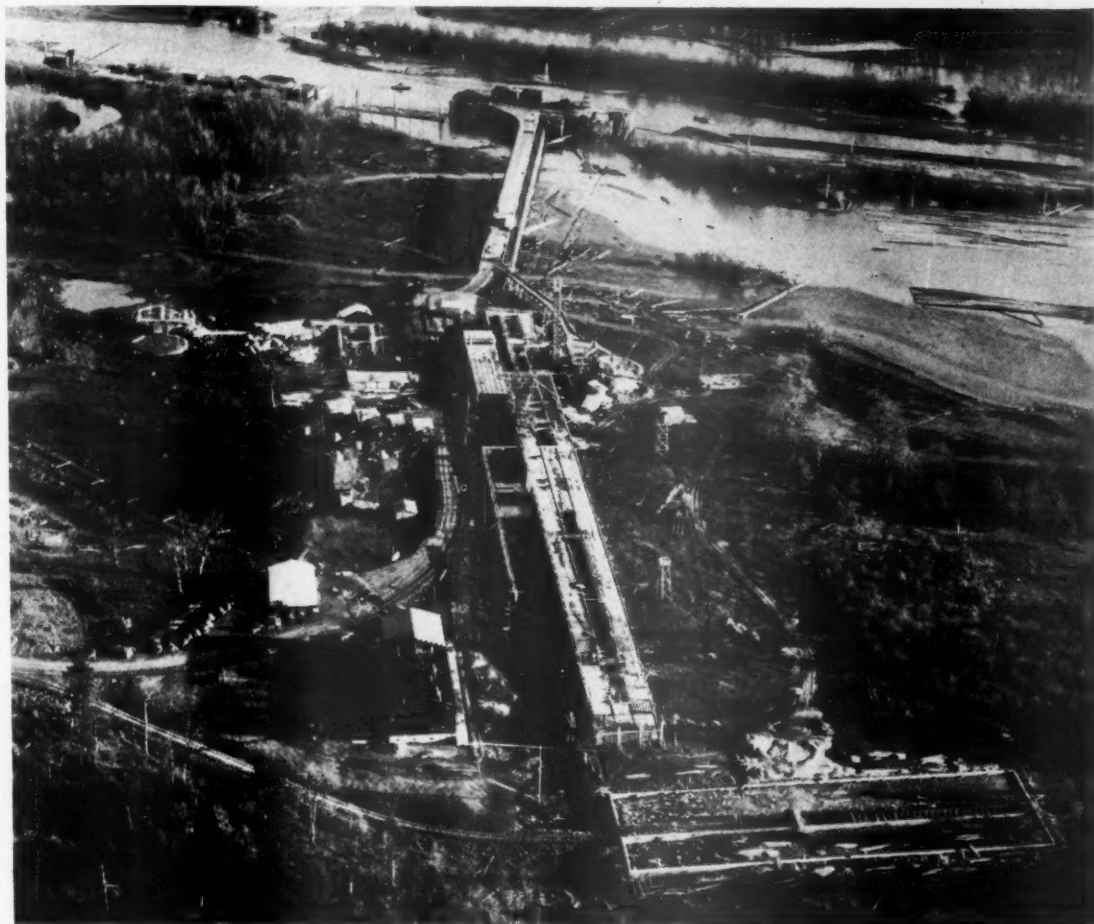
The project took over the idle war-time sawmill of the Spruce Production Corporation occupying a site on deep water about a mile south of the business center of Port Angeles.

The organization ties in the war-time government spruce road, now known as the Port Angeles Western Railroad, and also brings into the fold some of the most important lumber and logging interests on the Pacific Coast, backed by immense reserves of timber. At the close of the year it was also announced that the S. D. Warren Co. of Maine had taken an interest in, and would purchase substantial supplies of pulp from, the Port Angeles mill.

From the operating standpoint the mill will be one of the finest in the country. Building construction is of the most substantial type, effectively tying together sawmill, pulp mill, and transportation facilities.

The first unit will have four digesters for the cooking of high grade bleached sulphite, but the ultimate project contemplates the installation of from 10 to 12





Brubaker Aerial Surveys, Portland

## ST. HELENS, OREGON

At the close of 1929 the Fir-Tex Insulating Board Company was making good progress in the construction of a plant unique to the Pacific Coast. It will manufacture "Fir-Tex", wood fibre insulation board.

digesters, and other pulps may be manufactured later on. The Chemipulp system of pulp cooking will be employed.

Perhaps the most interesting innovation in the Port Angeles mill is the installation of a Minton Vacuum Dryer for pulp drying. This machine, which is being fabricated in the shops of Rice, Barton & Fales, paper machine builders, will have in place of the usual cylinders a fourdrinier with wire 156 inches wide. The wet end will have anti-friction bearings, suction couch roll, the usual wire and table rolls, suction boxes, and three main presses.

The dryer end will have 40 dryers, 60 inches in diameter. The machine is the first Minton dryer to be installed on the Pacific Coast.

\* \* \*

**U**NIQUE on the Pacific Coast will be the wood fibre insulating board to be manufactured by the Fir-Tex Insulating Board Co., which at the close of the year was engrossed in the construction of an immense mill at St. Helens, Ore., to have a capacity of 250,000 sq. ft. of "Fir-Tex" board per day.

When in production the plant will semi-cook sawmill refuse in six Biggs rotary boilers and will form its product, to be about one-half inch in thickness, on a Beloit fourdrinier having a 156-inch wire. Following a squeezing out process through a series of rolls the

board will be dried in a Coe dryer, said to be the largest of its kind in the world. The dryer will be 365 feet long, 13 feet wide, and will have 8 decks.

Another interesting feature of the Fir-Tex mill is that while it will reduce mill waste to a commercial product, it will burn only oil under its boilers. The plans call for adequate fuel oil storage. The mill will draw its full power requirements from public utility lines and will develop steam only in its boiler house.

Design and construction of the mill are being carried out by C. A. and A. E. Millington, who developed Fir-Tex and are interested in the mill.

\* \* \*

**A**T Newberg, Ore., the Spaulding Pulp & Paper Co. enlarged its activities during the year by the installation of a third Willamette digester 15x49 feet in size, bringing the mill's daily capacity up to about 75 tons of unbleached sulphite. This digester came into production in October.

At the same time the Spaulding company added another 300 h.p. boiler, it also added drying capacity, and made other changes. The Spaulding mill first began production in November, 1927. The 1929 improvements were carried out under the direction of Sigurd Norman, general superintendent.

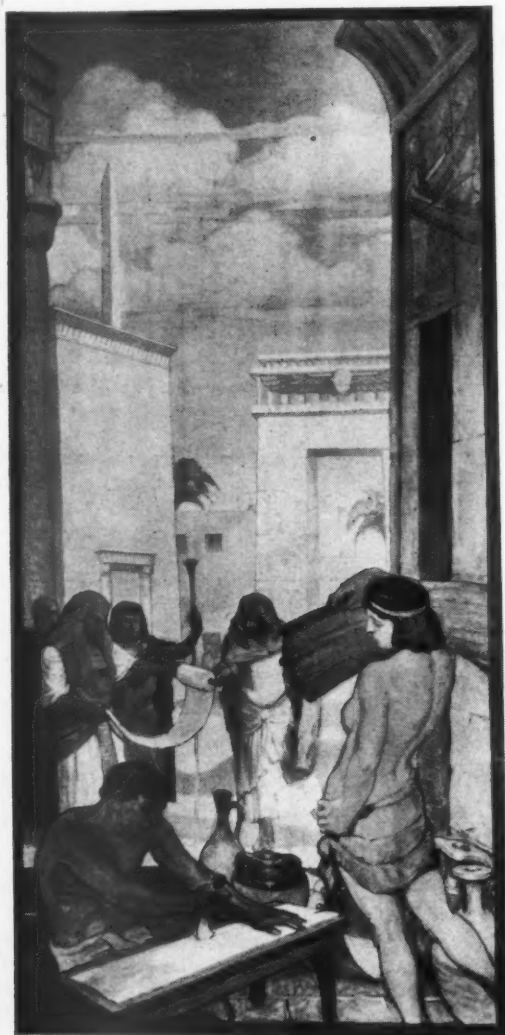
\* \* \*



**W**HILE not adding to the pulp or paper tonnage of the Pacific Coast directly the new \$1,500,000 plant of the Hooker Electrochemical Co. at Tacoma can in no sense be overlooked in a summary of new construction. It was the aim of the Hooker organization in building the Tacoma plant to incorporate some of the ideals that had been gathering for a quarter century. Accordingly they built what is not only a highly modern and efficient plant for the production of liquid chlorine and other chemicals, but they incorporated much of architectural beauty in their buildings at the same time.

At this juncture should also be mentioned the new plant of the Tacoma Electrochemical Co., completed on an industrial site at Tacoma during the year. The company is a subsidiary of the Pennsylvania Salt Mfg. Co. Completion of this new plant assures the growing pulp and paper industry on the Coast of an adequate chlorine supply.

A third addition in the line of chemicals was the building of a new plant at Portland by the Paper Makers Chemical Co., for the express purpose of providing central distribution for the growing Pacific Coast industry.



One of several mural paintings to be hung in the board room of the new Crown Zellerbach building.

**P**ORT MELLON, B. C. witnessed considerable activity during the year. The Leadbetter interests, operating four pulp and paper mills in Washington, Oregon and California, acquired the old Howe Sound mill at Port Mellon in 1927 and some time later began an extensive remodeling program there to modernize the mill and bring it up to a daily capacity of 100 tons of sulphate pulp.

The program included the building of a large saw-mill in connection, the building of a power plant, installation of much new machinery and other equipment and the addition of several new buildings.

Work progressed throughout 1929 and the project was very near to completion when all work ceased on the order of President F. W. Leadbetter just before the end of the year. The suspension is considered as purely temporary, but no official statement has been made on what disposition is to be made, or when work will be resumed, at Port Mellon.

#### INTERCOASTAL WATER BORNE SHIPMENTS OF PAPER—1928 WESTBOUND

(In cargo tons of 2,240 pounds)

Shipments From: To—

|                        | San Diego | Los Angeles | San Francisco | Portland | Seattle | Tacoma | Total   |
|------------------------|-----------|-------------|---------------|----------|---------|--------|---------|
| Portland, Me. ....     | 5,343     | 4,682       | 22            | 847      | .....   | .....  | 10,894  |
| Boston, Mass. ....     | 4,320     | 5,598       | 1,717         | 672      | 69      | .....  | 12,376  |
| New York ....          | 402       | 12,170      | 19,284        | 1,530    | 1,358   | 150    | 34,919* |
| Philadelphia ....      | 276       | 8,887       | 8,376         | 1,295    | 3,509   | 229    | 22,572  |
| Baltimore, Md. ....    | 72        | 1,144       | 2,348         | 134      | 548     | 25     | 4,271   |
| Norfolk, Va. ....      | .....     | 636         | 367           | 12       | 56      | .....  | 1,085§  |
| Savannah, Ga. ....     | .....     | 278         | .....         | .....    | 23      | .....  | 301     |
| Charleston, S. C. .... | .....     | .....       | 53            | .....    | .....   | .....  | 53      |
| Mobile, Ala. ....      | .....     | 60          | .....         | .....    | 21      | .....  | 81      |
| New Orleans ....       | 95        | 1,335       | 1,326         | 145      | 372     | 12     | 3,285   |
| Houston, Texas ....    | .....     | 34          | .....         | .....    | .....   | .....  | 34      |
| Total .....            |           |             |               |          |         |        | 89,871  |

\*Includes 25 tons to Anacortes.

§Includes 14 tons to Everett.

Source: United States Shipping Board, Bureau of Research, Maritime Records Division.

#### EASTBOUND

Shipments To: From—

|                         | San Diego | Los Angeles | San Francisco | Portland | Seattle | Tacoma | Total   |
|-------------------------|-----------|-------------|---------------|----------|---------|--------|---------|
| Portland, Me. ....      | .....     | .....       | .....         | .....    | 1,922   | .....  | 5,556*  |
| Boston, Mass. ....      | .....     | 8,608       | 8,233         | 5,044    | 947     | 4,211  | 35,106† |
| New York ....           | .....     | 949         | 3,760         | 10,982   | 831     | 1,186  | 22,752§ |
| Philadelphia ....       | .....     | 157         | 1,019         | 3,859    | 216     | 1,984  | 17,418‡ |
| Baltimore, Md. ....     | .....     | 3           | 725           | 112      | 62      | 4,619  | 6,548*  |
| Norfolk, Va. ....       | .....     | 283         | 43            | .....    | 250     | .....  | 576     |
| Savannah, Ga. ....      | .....     | 15          | .....         | .....    | 25      | 21     | 61      |
| Charleston, S. C. ....  | .....     | 20          | .....         | .....    | .....   | .....  | 20      |
| Jacksonville, Fla. .... | 109       | 194         | 1,055         | .....    | 404     | 25     | 1,965   |
| Tampa, Fla. ....        | 475       | 86          | 309           | .....    | .....   | .....  | 870     |
| New Orleans ....        | 165       | 59          | 746           | .....    | .....   | .....  | 1,258   |
| Beaumont, Texas ....    | .....     | .....       | 126           | .....    | .....   | .....  | 126     |
| Galveston, Texas ....   | .....     | .....       | 12            | .....    | 77      | .....  | 89      |
| Houston, Texas ....     | .....     | 2           | 196           | 302      | .....   | 12     | 512     |
| Total .....             |           |             |               |          |         |        | 92,857  |

\*Includes 2,092 tons from Grays Harbor; 1,542 tons from Bellingham.

†Includes 7,477 tons from Longview; 271 tons from Vancouver, Wn.; 315 tons from Bellingham.

‡Includes 33 tons from Astoria; 635 tons from St. Helens, Ore.; 3,395 tons from Longview; 250 tons from Vancouver, Wn.; 669 tons from Bellingham; 62 tons from Everett.

§Includes 9,982 tons from Longview; 100 tons from Vancouver, Wn.; 101 tons from Bellingham.

||Includes 470 tons from Vancouver, Wn.; 356 tons from Olympia; 201 tons from other Puget Sound ports.

¶Includes 178 tons from Port Gamble.

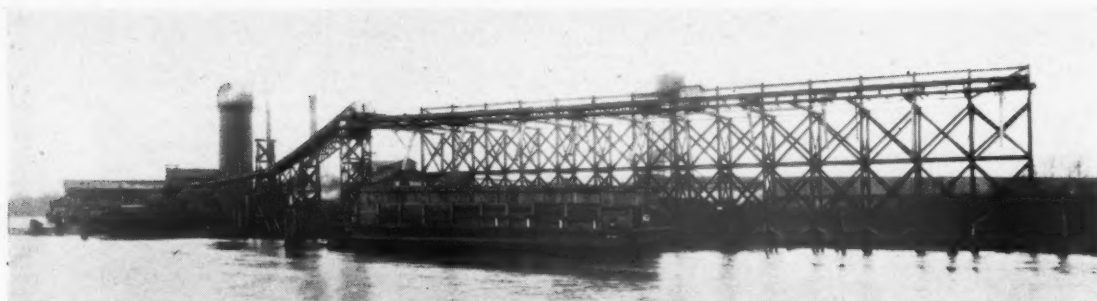
||Includes 288 tons from Longview.



Brubaker Aerial Surveys, Portland

**PORT TOWNSEND, WASHINGTON**

During 1929 the National Paper Products Company, Division of Crown Zellerbach Corporation, completed the second unit and is now operating a complete kraft mill of 200 tons daily capacity, pulp and paper. This plant draws practically all its wood and hogged fuel supplies from the wastes of nearby sawmills.



This conveyor system delivers pulp chips and hogged fuel to barges from a chipping plant installed at the Canyon Lumber Company, Everett, Washington, one of many such plants operated by the International Wood & Sulphite Company to work up sawmill wastes into useable materials.

On the question of

## WOOD SUPPLY —

The many methods employed indicate that there is no agreement on the most economical route from tree to digester.



HE aim of every pulp mill is to get cheaper wood. One would think that such a fundamental problem as pulpwood supply, bearing so importantly as it does upon the end cost of the finished manufacture, subject as it is to the constant study of every pulp mill manager and pulpwood contractor, would have reached an early solution, and would have been reduced to some common denominator of standard practice. Yet, with particular re-

spect to the Pacific Coast mills, it seems that nothing could be further from the truth. A survey of pulp manufacturing plants in the Pacific Northwest will reveal almost as many ways and means of handling the wood supply as there are mills. Wood is today coming to Coast pulp mills in the form of logs, cordwood, barked mill waste slabs, planer and mill ends and chips. There is great diversity, too, in the types of supervision over the wood supply. There are company-owned logging operations, sawmills owned by pulp mills, independent sawmills affiliated with pulp mills, company-owned cordwood cutting operations, small cordwood contractors, pulp mills taking sawmill waste directly from lumber operations, sawmills selling waste to chipping companies which convert the waste to refined pulp chips and then sell to pulp mills. The types of wood operations in vogue at present in Pacific Coast pulp mills run practically the entire gamut of imagination.

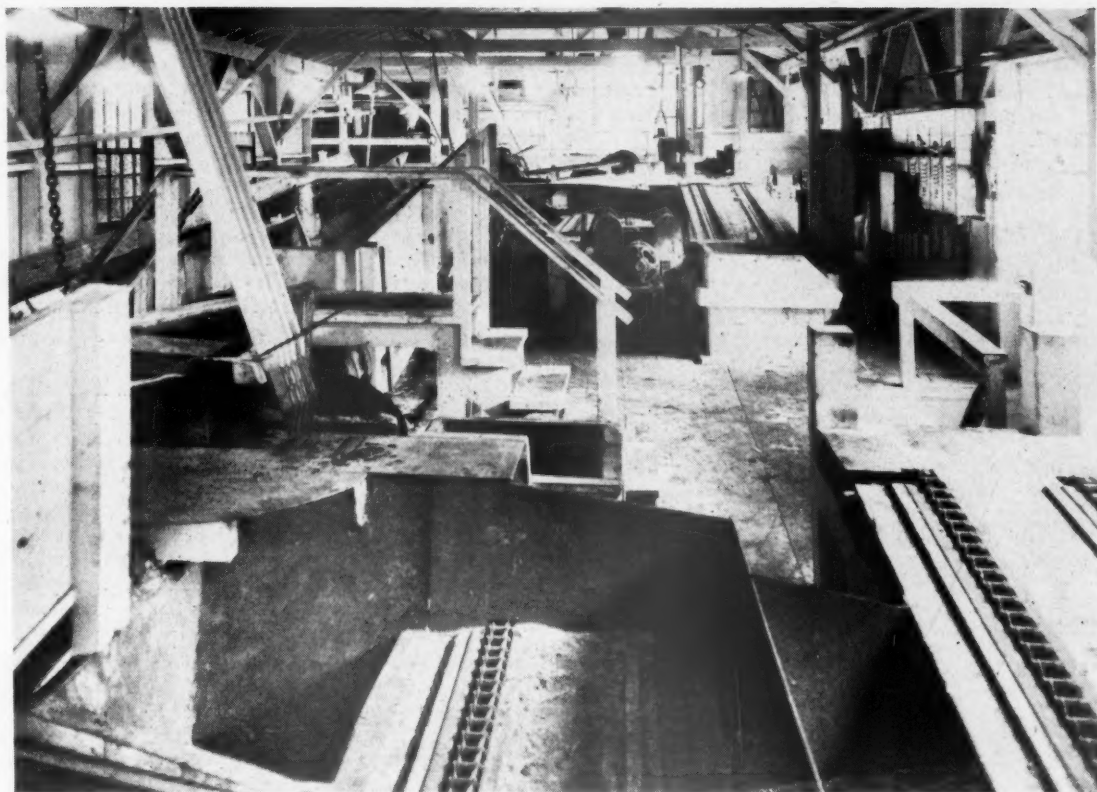
The first cost of wood, viewed only in the light of a potentially useful material, is comparatively insignificant. Values are built up in the handling and transportation charges superimposed between the source of supply and the digesters. The aim has been therefore not so much to secure cheaper stumpage as to whittle down these superimposed charges to the irreducible minimum.

Before taking up any discussion of methods now employed by Pacific Coast mills in handling the wood supply it is necessary to build some background for complete understanding. First, it must be realized that only in the past half dozen years has woodpulp manufacturing on the Pacific Coast sprung into prominence as a major industry. Prior to that time things were quite serene, but the rapid expansion of the industry in recent years has brought the pulpwood supply question into sharper focus, and from two sides, the pulp manufacturers who must buy wood, and the loggers, lumbermen and timber owners who wish to capitalize on this new pulpwood market.

In the second place the heavily timbered Douglas fir region of the Pacific Northwest has offered two tremendously important factors in the problem of pulpwood supply. The region is the home of the greatest and most wasteful lumber industry in the world. The second adjective is hardly complimentary. In cutting their annual billions of feet of lumber from big Pacific Coast logs the sawmills of the Douglas fir region have sent hundreds of thousands of cords of good sound pulpwood into the refuse burners. No reliable estimate of the extent of this waste has been made, but when one considers that several large pulp mills are today operating solely on the refuse of one or more sawmills a glimpse of the enormity of this collective sawmill waste is afforded. Further on in this article we will discuss in more detail how this sawmill waste pile is being reclaimed.

The second factor of importance is found in the excessive logging wastes. The denseness of the stand in the Douglas fir region, the great size of the prime lumber trees, the great admixture of small, understory trees—most of which are of that very desirable pulping specie, Western Hemlock—and the modern, high speed methods of logging have combined to effect a set of circumstances which make for staggering woods losses. In





One of the International Wood & Sulphite Company's typical chipping plant installations for handling sawmill waste.

snaking the big logs out of the woods with powerful machinery the entire forest is wrecked. Hardly a standing tree escapes, and those few that do are usually sacrificed in the slash fires following logging.

The U. S. Forest Service in a painstaking detailed study has estimated an average woods waste of 42 cords per acre of sound wood of cordwood size or larger left after logging in the Douglas fir regions of Washington and Oregon. The estimated annual logging waste for these two states is 6,500,000 cords in round numbers. If British Columbia is included, where tree species and logging methods are practically the same, another 2,000,000 cords of waste should no doubt be added.

The more studious executives have given much thought to the possibilities of drawing pulpwood from these two great potential supplies found in sawmill and logging wastes. And much progress has been made. Most of the methods employed in working up pulpwood for Coast mills today may be set down as milestones in the path of progress toward the ideal method of handling the wood problem, toward the utilization of these wastes. Let us thumb over the different methods presently in use.

#### Logs are Handy

Many mills are using logs. The log has its advantages. It is the natural unit. Logging machinery has reached a high stage of perfection for bringing these units out of the forest to railroad or water. Railroad equipment has been designed to handle log units in economical manner. The log lends itself readily to raft building and can thus avail itself of low-cost water transportation. Log markets have been established by long custom and a common language is spoken on such questions as log measurement, grading, transportation

costs, and relative prices. Standard sawmill equipment is readily adapted to log breakdown for pulp mill use.

Some of the Pacific Coast pulp mills, and this is particularly true of the larger units, conduct their own logging and transportation activities, bringing the logs to the pulp mill for breakdown. In this connection, it is interesting to note that one organization is now breaking down its smaller logs at the river landing and towing the wood to the pulp mill in the form of chips. Other mills prefer to stay out of the logging business and simply purchase their requirements from the open log market.

#### Logging Waste Salvage

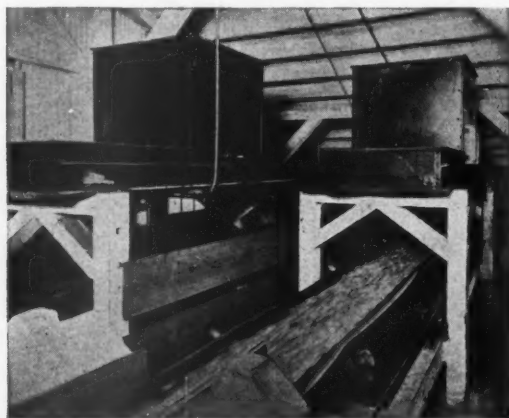
While on the subject of logs mention should be made of efforts and experiments to salvage logging wastes. Experiments in this direction are aimed in one of three directions: pre-logging, re-logging, or a concurrent operation of small logging and big logging. One paper mill company has made extensive experiments in relogging, making use of tractors and other light equipment, and by going in after the heavy logging equipment has moved on has been able to salvage from 20 to 40 cords of good pulpwood per acre. Their experiments have not satisfied them, however, that their method is the ideal one and from the standpoint of costs they claim no great advantage. It would seem, however, that even with no advantage in costs where the pulpmill owns the stumpage this saving of stumpage would at least be a worthwhile item.

One company, operating very extensive logging and mill operations but without a pulp mill of its own, tried the experiment of making a thoro cleanup on one logging "side." In this experiment every bit of sound wood



was taken out. Apparently the results were not satisfactory for the experiment was dropped and it is believed that the main reason for undertaking it was to make a thoro check on costs. The main fault, however, may have been that standard logging equipment was employed.

Here it should be mentioned that the heavy duty high speed logging equipment in use today in forests of the



Merrick Weightometers are convenient devices for measuring pulp chips and hogged fuel en route.

Douglas fir region is conceded to be too cumbersome to handle the small trees. These "small trees" earn this designation of size only in the eyes of Pacific Coast operators. "Small trees" may be anything below 14 inches in diameter and to the average Eastern pulpmill operator would be considered splendid material for pulpwood. The heavy logging equipment demands volume production to pay its way, and cannot afford to linger behind and pick up the "matchwood." There is distinct evidence that new light high speed equipment will be developed to take out the smaller trees suitable for pulpwood which are now destroyed in the ordinary logging operation.

Pre-logging has been experimented with in a desultory fashion. There are, however, some strong advocates of this method and it is probable that something worth while will be developed in the course of time. Pre-logging would permit, for example, the use of tractors to take out pulpwood in cordwood form on skids or by other means. This same procedure could not follow as efficiently after general logging operations because of the general debris which would seriously handicap the mobility of the tractors.

In breaking down the logs at the pulpmill there is no agreement on method. Some mills prefer to use adaptations of the standard sawmill, breaking the log into sizeable cants and handling these cants thru the woodroom for cleaning before sending to chippers or grinders. Other mills buck the log into short lengths of from 2 to 4 feet and split these short lengths with power splitters into pieces of convenient size for handling.

There is a very decided trend toward the integration of sawmills and the woodrooms of pulp mills. One paper mill has for some time operated its own sawmill. In this case the sawmill is used as a breakdown plant for the pulp mill. The clears and select lumber are cut out and all refuse in the form of slabs, trimmings, etc., go to the pulpmill. It is rather difficult in this case to draw a sharp line on wood costs for the pulpmill. With the sawmill and pulpmill under one management the prime

motive is supply wood to the pulpmill, salvaging from the log as much good lumber value as possible in so doing. The method, of course, is flexible in that more of the log can be diverted to the pulpmill or to the sawmill as market prices for one commodity or the other dictate. In some other cases pulpmills have endeavored to salvage the clear stock from the log and have subsequently given up the idea and turned the entire log into pulp. While there is considerable criticism on the economic justification, for example, of turning a fine clear spruce log into pulp, the method nevertheless enables the company to concentrate on its main function, pulp manufacturing, and not be forced to spread its efforts.

It is significant that two of the largest new pulpmills have incorporated sawmills in their plants.

There are other ways of tying the sawmill in with the pulpmill. In one case a big lumber company has entered into a long time contract to supply wood to a sizable pulpmill. Where the sawmill is under independent management quite a different set of conditions exist than in the case where the pulpmill and sawmill are under the same direction as in the example just discussed. Where an independent company operates a sawmill it is primarily interested in securing as much lumber as possible from the logs. The pulpmill takes the residue. And it would seem that if methods of lumber cutting are refined so as to permit taking more lumber from the log than under present procedure the pulpmill will find poorer pickings on the refuse conveyor.

The example just mentioned is a case where one sawmill has tied up to one pulpmill, and delivery of the waste wood is made directly on conveyors. In another instance a pulp mill of more than 100 tons capacity is operating almost exclusively on the refuse of a big independent sawmill. In this instance, however, instead of the refuse being conveyed into the pulpmill's woodroom for cleaning and reduction to chips, the chippers are installed in the sawmill. A certain amount of clean waste, however, is taken to the pulpmill in raw form and stored against emergencies. The case just cited is also one where one sawmill and one pulpmill, each under independent management, are tied together thru the medium of waste wood contracts.

#### How to Measure?

One big stickler in waste contracts of this kind is the difficulty of measuring wood waste with accuracy. The usual method of measurement seems to be a computation of the finished product; that is, the sawmill is paid according to the number of units of finished chips converted from the waste. Such procedure is not entirely satisfactory to either pulpmill or sawmill in that one or the other might be inclined to complain that either not enough waste was being taken or too much waste was expected to be taken from the conveyor chain.

In some other cases where pulpmills are operating their own sawmills the growth has been from lumber to pulp. Stated otherwise, the management comes from the lumber school rather than from the pulp school. It is rather interesting in this connection to note that supervision of the wood room in these instances is usually under the direction of the superintendent of the sawmill. In most other instances supervision of the wood room is under a man schooled in pulp mill requirements.

One of the most interesting developments in the Pacific Coast pulp industry has been the organization of an independent company which acts as a go-between between sawmill and pulpmill. The function of this organ-



Brubaker Aerial Surveys, Portland

**SHELTON, WASHINGTON**

The 135-ton bleached sulphite pulp mill of the Rainier Pulp & Paper Company, completed early in 1927, effected a rather unique wood-using center. Two sawmills adjoining, one cutting Western Hemlock and the other cutting Douglas fir, contribute their wastes to the chip and fuel requirements of the pulp mill. A central steam plant serves all three plants. During 1929 another digester and additional steam capacity was installed.



The San Juan Division of the Puget Sound Pulp & Timber Co., pioneered in the use of sawmill waste.

ization is to contract for the sawmill wastes of a number of scattered sawmills, to install complete chipping plants in these several sawmills and to sell refined chips as a commodity to pulpmills located at other points. The development has come about entirely within the past four years. This company salvages as much of the sawmill waste for pulp chips as it can and diverts the remaining material into hogged fuel. Thru this company it has been possible for a number of sawmills which do not cut lumber in sufficient volume to afford a continuous supply of sufficient volume for pulpmills to find an outlet for their wastes. In many instances this new market for sawmill waste has developed a new revenue amounting to several hundreds of dollars per day for the sawmill. The sawmills have long term contracts with this "third party" chipping company and their responsibility ends with the deposit of their sawmill refuse on the main conveyor. The chipping company virtually builds its chipping plants straddling the refuse conveyors.

Of course one of the principal problems in converting sawmill wastes has been to devise equipment and methods for cleaning the waste wood and reducing to chips in economical fashion. A great deal of progress has been made in this direction in the past four years. Some attempts have been made to convert the waste to four-foot lengths at the sawmill and to transport the waste in the form of barked slabs to the pulpmill, there to be reduced to chips. There is apparently a stronger tendency, however, to carry the complete barking and chipping operation thru at one station, that is, right at the sawmill.

Some large lumber companies, however, are salvaging a great deal of sawmill waste. In some instances barking plants operated by the sawmill have been installed for the production of clean slabs which are marketed to pulpmills as a commodity. In other cases sawmills and box factories are diverting their planer and mill ends to pulpmills.

It is perhaps significant that there is a growing appreciation among the lumbermen that refined chips for pulp mills represent a distinct commodity. In other words, chips are being manufactured under the super-

vision of the men who know the requirements of the pulp mill. It is quite certain that Pacific Northwest lumbermen as a group appreciate more fully today than they did five years ago that pulp chips must be produced under very definite specifications and that the pulp mills are not in the market simply for small particles of wood.

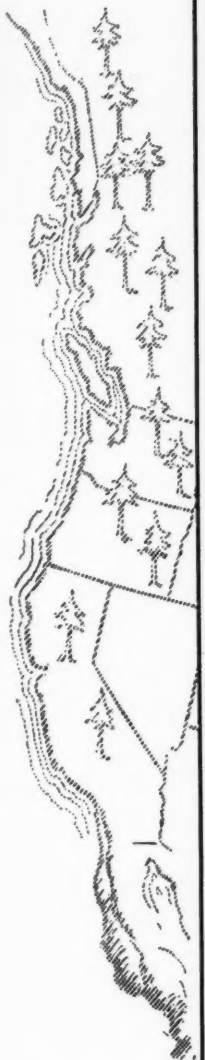
The salvage of sawmill waste has some definite limits. It cannot go beyond the potential supplies of sawmill waste, and since there is some tendency toward a smaller production of lumber and toward greater refinements and elimination of waste in lumber production, those pulp mills drawing their wood from sawmill refuse will no doubt meet a point where handling costs and total supply will effect a compromise.

There are many indications that much of the future wood supply for Pacific Coast pulp mills will be in the form of cordwood. The many experiments being carried out in salvaging log wastes point in this direction. Some companies are now operating their own cordwood camps and others are encouraging the development of small pulp wood contractors. In one instance a company has combined a cordwood and chipping operation in the forest under one management.

The small contractor promises to be a determining force in pulp wood prices of the future. Already many of the mills are making small purchases of cord wood. These cordwood supplies may trickle in from small contractors employing a few men or they may come from farmers or laborers who find good employment in the cutting of pulp wood during off seasons. Men of this type are usually satisfied to make wages. They require little more than an axe to set themselves up in the pulp wood cutting business; they can work the small stands of timber which may be virgin growth passed up by the great logger or second growth springing up since the logger has gone and now of good pulp wood size.

It is certain from the many methods employed in getting pulp wood supplies as sketched in the preceding paragraphs that no standard practice has been involved and that developments of the future can scarcely be predicted with accuracy before they happen.

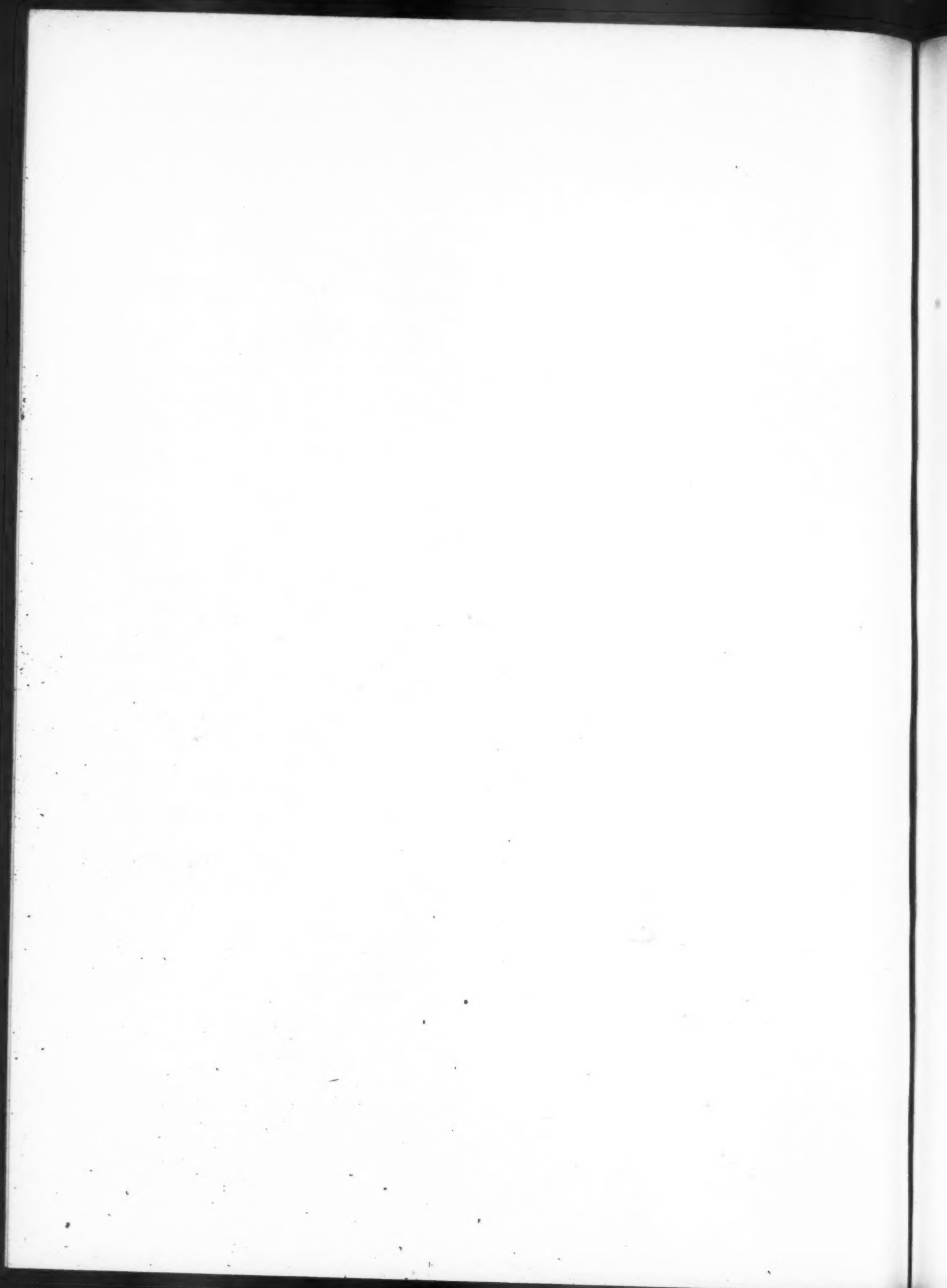




Supplement to Pacific Pulp & Paper Industry

**OSSIAN ANDERSON**  
President, Puget Sound Pulp & Timber Co.

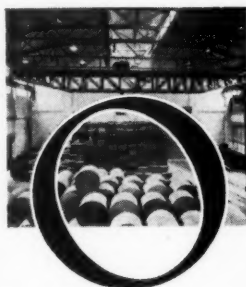




# The Old Forest Order Changeth

Forestry—real dirt forestry—with balanced budgets of cut and growth, and complete utilization, is being hailed as the salvation of forest industry communities

By C. M. GRANGER  
Forest Economist



ONE day last summer I was out in Central Oregon's pine forests with one of pinedom's ablest logging superintendents. He keeps the logs moving to a battery of mills that turn out over 150 million feet of lumber a year. The superintendent spent a large part of the day showing me the rapid growth of the small trees left uncut when the area was logged a few years before, and predicting how soon another crop could be harvested. We gloated over the way the tree crowns had expanded and rounded out when the trees too small for sawlogs had been freed from the competition of their larger neighbors. The superintendent was prouder of a fine, thrifty-looking sapling saved from damage in logging than he was over a day's record load with the "cats" and big wheels.

One of the biggest pondosa pine operators in the country recently cooperated with the Forest Service in a study of the costs and returns from logs and trees of different diameters. Logs from trees of all sizes were stop-watched from the stump to the green chains. The higher cost of converting small logs as compared with big ones, and the lower quality and value of the small-log product demonstrated that the operator could make as much money per acre by leaving uncut all trees 16 inches in diameter, breast height, and under, as by cutting them. The young, thrifty trees could be left without loss to the company to grow with accelerated energy into a second crop. If you will go and look at their current woods operations, you will see for yourself how a progressive concern uses forestry facts. And when this outfit, or that of my friend of the opening paragraph, finds a fire in the woods they go and put it out "right now". What is being done on these two holdings is not all of forestry, but it is indisputably of the essence of forestry.

## Sustained Yield

Up in northwestern Washington a rapidly-expanding pulp and paper company has just bid on a tract of national forest timber containing something over 500 million board feet, which they will be permitted to cut at an average rate not exceeding 25 million feet a year. On top of this, they will utilize down to a size of log that would strike the average logger with horror. The government insists on these things, because it is applying the sustained yield principle to its timber harvesting. The purchaser is meeting these sale requirements because he has a costly pulp mill, just built, for which

he wishes to have a permanent supply of raw material, which the national forest timber will supply in part. Permanency means both balancing the cut with the growth rate and utilizing every cubic foot of wood that can possibly be converted at a profit. Can you imagine any big concern being willing—or able—five years ago to operate a logging unit at the rate of only 25 million a year?

Another Washington operator, anxious to buy large quantities of national forest timber on the Olympic peninsula, volunteers to meet every utilization requirement

C. M. GRANGER

Forest Economist  
In charge of the  
National  
Forest Resource  
Survey



of the Forest Service. He is already embarked, directly or indirectly, on the pulp and paper course as a means of meeting the inevitable need to make forest cropping permanent and profitable by using everything but the rustle of the leaves.

The cooperative woods-waste study made by the Forest Service showed that the average logging operation in Douglas fir leaves on the ground 20 per cent of the sound wood of pulpwood size and larger—something over 20,000 board feet to the acre. The average operator hasn't been able to find a way to convert this waste into dollars. The market hasn't wanted it. The PACIFIC PULP AND PAPER INDUSTRY and the WEST COAST LUMBERMAN published and featured these findings.

The Pacific Logging Congress saw the tremendous possibilities of turning the unutilized sticks into revenue if some way could be developed for pulping Douglas fir, which so far has been refractory. The Forest Products Laboratory at Madison, through its director and chief pulp man, came, saw, and held out much hope. The Logging Congress and others are seeking a federal

appropriation to enable the laboratory to get at the secret of making paper out of Douglas fir. The prospects for funds are excellent, and the favorable results secured with obstinate woods in other regions argue well for success here.

Isn't it obvious how much would be added to the permanence and profit of the forest industry if that unused 20,000 feet per acre of sound wood could be converted into net profits? And every man who has to protect cutover lands from fire knows how tremendously the removal of that mass of inflammable material would reduce the fire hazard.

The idea of selective logging in the Douglas fir region is gaining currency. Not by individual trees—though that will come later, at least in second-growth, but by areas. Several logging engineers are prepared to prove to their employers or clients that more money is to be made by cutting the profit-containing shows first, and coming back to the others later when they have come into that class. Some operators are substantially doing this now. One of the large Douglas fir concerns is beginning a study to determine both costs and profits from both specific areas and trees of different sizes. Is it likely that the old practice of taking everything as it comes will long prevail? The Forest Service, in Washington and Oregon, has in the past five years denied purchase applications for over four billion feet of timber, largely because it was economically or silviculturally unripe.

#### Five Year's Change

Five years ago a prophet would have been without honor in any country who would have forecast that in less than that time all the sawmill waste on Puget Sound would be tied up by contract for pulp chips or fuel. Or that the sawdust furnace would cause a shortage of that by-product. Or that one of the biggest loggers on Gray's Harbor would be anxious to buy and develop part of a sustained yield unit of national forest timber—850 million feet of it—in which he is not allowed to log at the rate of more than forty million feet a year, and to utilize more closely than ever before. Who would have predicted the rapid growth of pulp mill installations?

Forestry—real dirt forestry—with balanced budgets of cut and growth, and complete utilization, is being hailed as their means of salvation by forest industry communities. None is more forward-looking in this respect than the associated community group on Gray's Harbor. The forest dollar built Gray's Harbor's fine towns, and it will require the forest dollar ever coming in to keep them fine and progressive and prosperous, as they are now.

You don't need to take my word for this; go ask the leaders in Gray's Harbor communities. You will find them studying the problem of how to maintain the forest industry in its present size, and at the same time get on a sustained yield basis. You will find them applauding the sustained yield policy of the nearby national forest and the decision of the State Land Commissioner to withhold from sale the vast state timber holdings in that region until a permanent plan of forest management has been worked out.

You will hear gratification expressed that the timber on the Quinault Indian Reservation is not to be sold immediately, and hope that a way will be found to place that body of timber under forest management. There will be apparent to you active efforts to stimulate the development of by-products plants and new wood-using industries, both to use wood now unutilizable in the

woods and mills, and to secure the added payrolls and stability which comes from remanufacturing at home instead of shipping rough lumber straight from the saw. There is manifest a purpose to find out how to make forestry—sustained yield and all—profitable on the huge areas of cutover, private land on Grays Harbor, where the bulk of the future supply must come from.

The organized lumbermen are doing more than ever to adjust output to demand. Even better than this, they are spending lots of dollars to keep and extend the markets for wood. Hemlock is being slowly graduated out of the stepchild category. It was given an honored place at the last annual meeting of the West Coast Lumbermen's Association.

Public funds are more and more generously supplied to share the cost of fire protection on state and private lands, under the Clarke-McNary Law. The federal contribution is getting very much closer to its one-fourth share.

#### Priority

The Forest Service, recognizing the outstanding importance of the timber situation and problems in the Douglas fir region, has given the region first priority in the forest tax and forest insurance studies under the Clarke-McNary Law, and the nation-wide forestry survey under the McSweeney-McNary Law. The taxation study findings will probably soon be available. The insurance study is just beginning. The forest survey is under way. It will show how much timber there is, how fast it is being depleted by cutting, fire, insects and disease; what the annual growth is, and what are the present and probable wood requirements of the country. The project is one of fact-finding, without regard to previous estimates, forecasts, or any attempt to prove any theories.

Out of these projects should come a set of facts that will furnish a large part of the basis for the formation of public and private forest policies and programs.

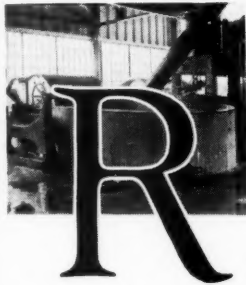
#### Straws in the Wind

All of these things I have enumerated are straws which show the direction of the wind. There is a gentle breeze steadily blowing forestry-ward. But it is still only a breeze. The forest fire problem is far from solved, as 1929 unhappily witnesses. There is still far too little appreciation of what fire is doing to the productiveness of our forest land in its destruction of young growth. Fine hemlock logs still go begging in vast measure. There is still more potential pulpwood left annually in the wake of our logging operations than is cut and used all elsewhere in the United States each year. We are far from mastering the slash disposal problem. There is yet too much forced liquidation of timber, glutting markets, and depressing prices. Tax delinquency on cutover lands is by no means arrested. State forest policies are still in the formative stage.

What we need is to get this forestry breeze boosted up to a good strong wind. We don't want any gales or tornadoes, but a steady "trade-wind" kind of lusty breeze is the thing for us, impelled by a determination to take advantage of every economic possibility and development, every avenue which research can open for us, every bit of strength which comes from a joining of all forces in cooperation, until every acre that ought to be growing forest crops is doing just that thing, and every cubic foot of harvested wood has been squeezed dry of every nickel it can possibly make for the owners and the communities where it grew. What of the next five years?

# The Shift In Industry

Some developments which mark the migration of pulp and paper manufacturing from East to West.



RECENT years have wrought tremendous changes. It is now generally—but by no means unanimously—conceded that there is taking place a definite shift in the pulp and paper industry from East to West. All optimists will concede the point. Some of the pessimists concede it, unwillingly. A few would attempt to stem an economic

truth, but with about as much success as an ancient king who tried to sweep back the ocean tides.

There is nothing to be gained in denying the fact that Eastern mills are more and more feeling the pressure of dwindling supplies of pulpwood. With the tremendous growth of consumption of paper of all kinds, new timber supplies have had to be tapped. A study of imports of pulp and paper will demonstrate the increasing dependence of the United States—the world's greatest paper consumer—upon outside sources of pulp and paper. The lifting of the news print tariff some years ago saw the news print industry virtually pick up its mills and hike across into Canada, until today Canada makes news print at a rate of about two to one with her neighbor on the South.

But man-made limits in the form of tariff on the whole realm of paper, with the exception of wood, pulp and news print, have served to keep the manufacture of other grades within the borders of the United States, save for a light sprinkling of imports.

Until a scant half decade ago the Pacific Coast was sufficient unto itself in paper requirements for the more common grades. Its purchases of paper were confined largely to the specialty grades. It made no pulp for sale outside of its own limits. It sold no paper outside its home market. There was something of a gentleman's agreement with respect to trade territories. Set apart by fate of geography the Pacific Coast was a paper kingdom unto itself.

To expect a condition of unruffled equanimity to last in these days of changing times was perhaps not giving the factors in the equation due thought. Here on the one hand was an increasing national paper consumption attempting to meet its needs with dwindling pulpwood stands. On the other hand were vast stores of pulp timber on the West Coast waiting to fill these increasing demands. Enterprising minds were bound to bring these two factors together and to capitalize upon them.

At the outset of the "new era" in pulp and paper mill building on the Pacific Coast—which really got under full steam hardly five years ago—there were some cries of "What are you going to do with all the pulp and

paper? The Coast's relatively small population can't absorb it." To which the sensible answer was made that there was no intention of the Coast absorbing it, that the rest of the country would absorb it, in fact needed it. As well to argue that all the salmon canned in Alaska would be eaten in Alaska.

In 1929 a number of definite steps marking the shift in the industry from East to West can be traced. What happened in the four or five years previous can be summed briefly. The B. C. Pulp & Paper Co. was selling pulp to Eastern United States paper mills. The Fidalgo Pulp Manufacturing Co. built a 50-ton pulp mill and began selling pulp to Eastern paper mills. This pioneer was followed by a companion mill under the same management, the San Juan Pulp Manufacturing Co. Then followed the Rainier Pulp & Paper Co. in 1927, the Spaulding Pulp & Paper Co. in 1927, the Grays Harbor Pulp & Paper Co. in 1928, and the Shaffer Box Company's pulp mill in 1928. All these have sold practically every ton of their pulp to Eastern paper mills—Grays Harbor one-third excepted with the completion of the paper mill.

In 1927 the Longview Fibre Co., an offshoot of a Wisconsin mill, was completed in Longview. In 1928 the Union Bag & Paper Corp., pressed for pulp supplies for its Eastern paper mills, completed a 120-ton kraft pulp mill at Tacoma to feed its other units.

## Milestones

These were some of the high spots which constituted definite milestones in the shifting of the industry prior to 1929. By this time a fair tonnage of Pacific Coast pulp was beginning to roll in steady and increasing volume into Eastern markets. Pacific Coast pulp was beginning to take on the semblance of a definite commodity.

In the year just past more milestones have been erected for history. For example, early in 1929 the Hooker Electrochemical Co., long established in the East, made a formal bow to the growing pulp and paper industry in the West and dedicated with fitting celebration a "last word" industrial plant at Tacoma for the production of paper chemicals, principally liquid chlorine. Theirs is a \$1,500,000 plant, designed for efficient production, but incorporating as well an unusual measure of beauty in its architecture. Hooker's president, at the dedication of the new plant, said in effect that the company foresaw a great pulp and paper industry on the Coast and had prepared to serve it.

At about the same time the Tacoma Electrochemical Co., a subsidiary of the strong Pennsylvania Salt Co. in the East, completed a big plant for the production of similar products, also foreseeing the early coming of steadily widening markets for paper chemicals.

Also in the field of chemicals, the Paper Makers Chemical Co. made a move to serve better the pulp and paper



industry of the Coast by erecting during 1929 a service plant at Portland.

Other significant moves in the realm of industries auxiliary to the pulp and paper mills have been the establishment of branch factories or agencies to provide better service on equipment for the Coast mills.

While paper from Pacific Coast mills has been marketed in somewhat desultory fashion outside of Coast sales territory prior to 1929, the past year saw some most important moves in this direction. As is by now well known, the Hammermill Paper Co., of Erie, Pa., in 1928 acquired a substantial interest in the Grays Harbor Pulp & Paper Co. at Hoquiam. In the early fall of 1929 the Grays Harbor company completed a 50-ton paper mill unit for the manufacture of bond papers and began marketing "Management Bond—A Hammermill Prod-

Reasonable freight rates are of paramount importance in getting to the markets of the world. It is encouraging to know that the transportation companies, both rail and water, have recognized the potentialities of the growing pulp and paper industry of the Pacific Coast by adjusting their charges. Pacific Coast pulp has for some time been moved to the Atlantic seaboard for \$6 per ton, and last year a \$10 water rate was quoted on paper shipments. This is particularly significant and should materially encourage ultimate paper—rather than pulp—production on the Coast. By rail pulp is getting into Middle West territory for from \$11 to \$13 per ton.

uct" on a national basis. This move was perhaps the first real definite step in marketing a Pacific Coast paper outside of Coast territory. The launching of a national advertising program to introduce this new paper has left no doubt.

Another step into the field of national distribution—altho the campaign opened shortly after the close of 1929—is the marketing of Zee and Zalo sanitary tissues by subsidiaries of the Crown Zellerbach Corporation.

Mention of the \$100,000,000 Crown Zellerbach Corporation at this juncture also recalls one other point of significance in making the continent generally aware of the existence of a pulp and paper industry on the Pacific Coast. It is the listing of Crown Zellerbach securities on the New York stock exchange. Not everyone is yet aware that the Coast has in the Crown Zellerbach Corporation the second largest paper organization in the world.

Further obliteration of any bounds which may have heretofore marked the limits of the Coast industry has been the establishment of a number of sales offices in Chicago, New York and other Eastern points by Coast mills.

Fibreboard Products Inc. in 1928 acquired a strong foothold in the East with the purchase of the Federal Container Co. in Philadelphia. In 1929, Crown Zellerbach Corporation purchased the West End Paper Co.'s mill at Carthage, N. Y., to operate it in conjunction with the Carthage Division of their subsidiary, the National Paper Products Co., the express purpose being to take care of a growing Eastern business.

Longview Fibre Co. made a definite move into Eastern territory during the year with the purchase of the General Container Corp. of Springfield, Mass., thus affording a good outlet for some of their kraft container board.

One of the most significant moves of 1929 came just as the year drew to a close. Reference is made to the purchase by the S. D. Warren Co. of Maine, of a sub-

stantial interest in the Olympic Forest Products Co. which is building the first 150-ton unit of a bleached sulphite pulp mill at Port Angeles, Wash., to be in production in the summer of 1930. The S. D. Warren Co. at the same time entered into a 20-year contract for substantial supplies of pulp, a contract said to be the largest of its kind ever made. The particular significance of the S. D. Warren move is manifold. It demonstrated first that the economic situation now requires paper mills in the famous paper state of Maine to seek pulp supplies outside its own limits, and, second, that Pacific Coast pulp can satisfactorily meet the requirements of the high grade paper makers.

Aside from sending its products into the Eastern part of the United States, which constitutes the world's chief market for paper goods, the Pacific Coast mills are steadily expanding their sales territory in the export field. The Powell River Co. Ltd. is a notable example in this instance, having developed most substantial outlets for its news print in the Orient, Australia and South America. Pacific Mills Ltd., has been shipping a substantial tonnage to the Orient and elsewhere. The British Columbia Pulp & Paper Co. Ltd. has been steadily cultivating the Japan market for its pulp, particularly its bleached product.

### The Orient

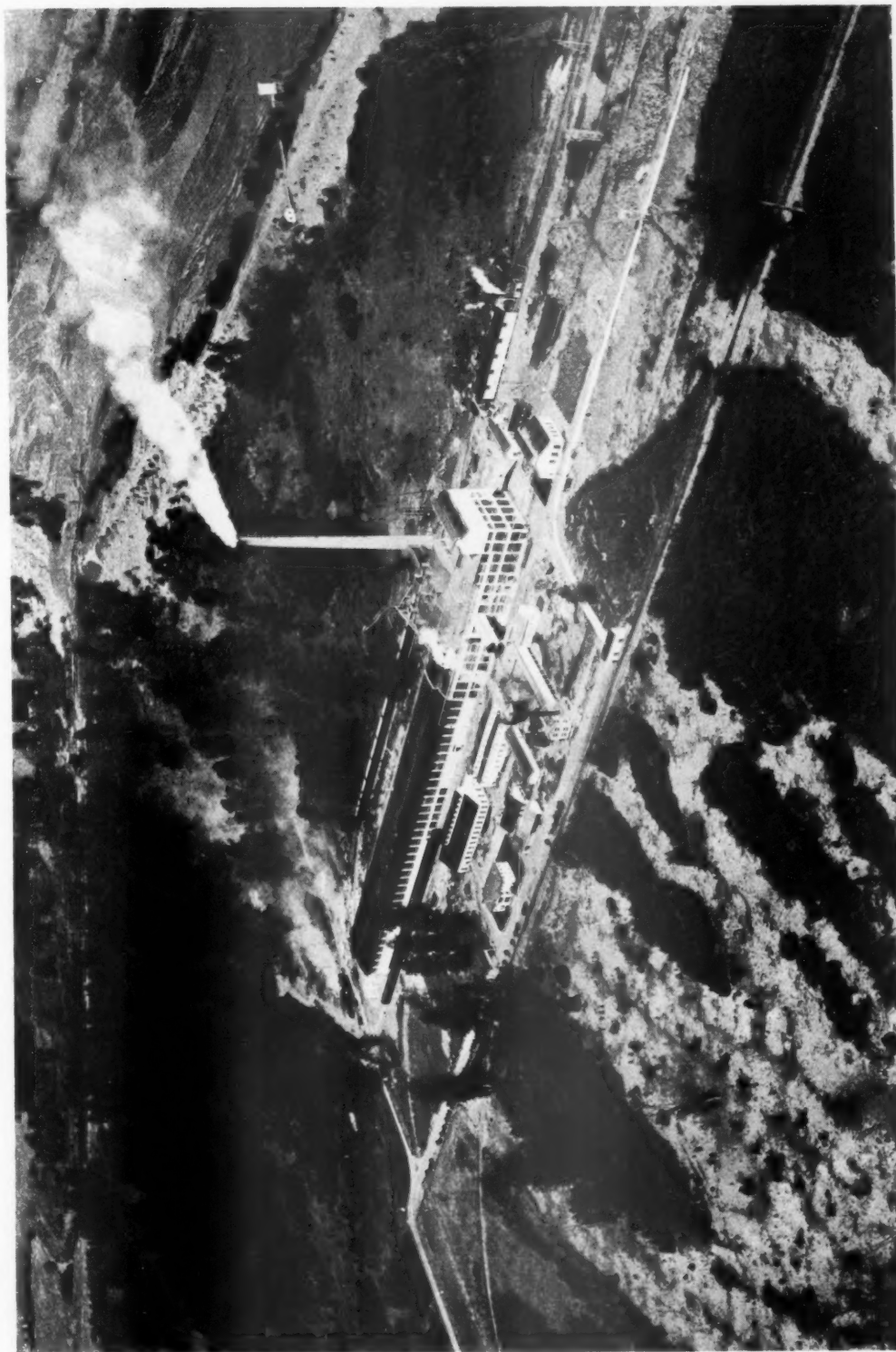
The Grays Harbor Pulp & Paper Co. and the Rainier Pulp & Paper Co. have both been reaching the Orient with some bleached sulphite. The San Juan Division of the Puget Sound Pulp & Timber Co. has sent a number of shipments of unbleached sulphite to South America, Italy, France and elsewhere. The Everett Pulp & Paper Co. has been placing book paper tonnage in the Orient. These are but a few examples to indicate that the Pacific Coast has outgrown its once self-contained status and is reaching out into the markets of the world, giving growing significance to the fact that the Pacific Coast is developing what promises to be one of the most important pulp and paper manufacturing centers of the world.

An article on the shift in industry from East to West can hardly be confined to pulp and paper alone, altho the strides in that branch have been scarcely short of marvelous. There have been important shifts in other fields, moves that bring the Western states into a new significance, which tend to wipe out the last vestiges of thought in the older regions East of the Mississippi that "West of the Rockies" is a land only of bad men, six-guns, grizzlies and wide open spaces.

For example, note the phenomenal increase in shipping tonnage moving thru the Los Angeles Harbor until annual movement now makes this Pacific Coast port second only to New York in the United States.

Steel, many years thumbing a nose at the Pacific Coast, jumped in with both feet in 1929. U. S. Steel took California's Columbia Steel Corporation into the family during the year, and Bethlehem Steel Co. bought up the Pacific Coast Steel Co. of Seattle. Fisher Body Corporation, internationally known, came out to the Coast for supplies in 1929 and established a plywood factory in Seattle. Ford moved into Los Angeles with a huge investment for manufacturing and his cohort in rubber, Firestone, put up a big factory to fabricate tires in Southern California.

Our purpose is not to catalog, but only to show trends, to point out how some of the internationally known organizations are looking West—and discovering.

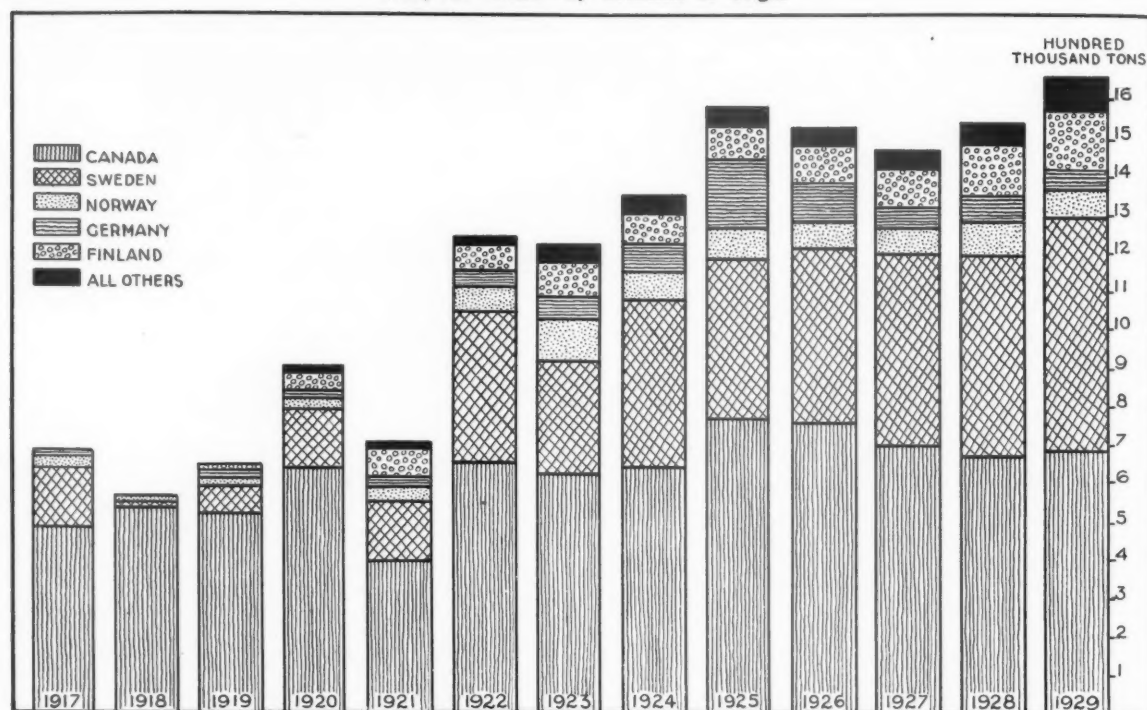


Bridgman Aerial Surveys, Portland

#### LONGVIEW, WASHINGTON

The 120-ton sulphate mill of the Longview Fibre Company was completed in the fall of 1927. During 1929 it rounded out its activities with the addition of a groundwood mill and a paper bag factory. The Longview plant utilizes Douglas fir waste from the big sawmill of the Long-Bell Lumber Company for its principal wood requirements.

**PACIFIC PULP & PAPER INDUSTRY**  
**WOOD PULP IMPORTED BY UNITED STATES—1917-1929**  
 Total, All Grades—By Countries of Origin



**WOOD PULP IMPORTS TO THE UNITED STATES BY COUNTRIES OF ORIGIN**  
 1917 to 1929  
 (Quantity in tons of 2,000 pounds)

|       | Canada  | Sweden  | Norway  | Germany | Finland | All Others | Total     |
|-------|---------|---------|---------|---------|---------|------------|-----------|
| 1917  | 486,832 | 158,961 | 27,683  | -----   | -----   | 4,365      | 677,841   |
| 1918  | 571,675 | 784     | 5,750   | -----   | -----   | -----      | 578,209   |
| 1919  | 519,212 | 85,579  | 12,508  | -----   | 15,327  | 3,390      | 636,016   |
| 1920  | 655,144 | 156,518 | 34,261  | 8,875   | 42,599  | 8,900      | 906,297   |
| 1921  | 402,846 | 168,482 | 39,923  | 20,221  | 56,354  | 9,274      | 697,100   |
| 1922  | 645,416 | 409,682 | 95,620  | 28,056  | 68,441  | 11,021     | 1,258,236 |
| 1923  | 633,357 | 300,123 | 107,054 | 58,969  | 99,062  | 19,830     | 1,218,395 |
| 1924  | 636,218 | 441,742 | 91,119  | 75,360  | 79,356  | 34,861     | 1,358,656 |
| 1925  | 783,031 | 427,552 | 97,573  | 174,391 | 78,426  | 36,540     | 1,597,513 |
| 1926  | 768,889 | 481,393 | 82,141  | 87,766  | 91,133  | 39,582     | 1,550,904 |
| 1927  | 695,535 | 532,485 | 79,757  | 52,322  | 99,190  | 36,934     | 1,496,223 |
| 1928  | 690,719 | 537,410 | 84,642  | 64,941  | 138,090 | 40,909     | 1,556,711 |
| 1929* | 703,155 | 629,046 | 78,524  | 62,916  | 155,341 | 45,240     | 1,647,222 |

\*Subject to minor revision.

Source: United States Department of Agriculture, Bulletin 1241 for years 1917 to 1922; Department of Commerce, Foreign Commerce and Navigation of the United States for years 1923 to 1929.

### Where United States Pulp Imports Originate

The accompanying chart shows the steadily increasing total pulp imports of the United States, as well as the foreign nations contributing.

Canada, due to its proximity and extensive forest lands, has for many years been an important contributor of wood, pulp and paper. The first two, being free imports, have had nothing to restrict their flow.

Canada is making a concerted effort to retain the benefit of manufacture within its borders. The chart illustrates the tendency downward of Canadian pulp exports to the United States. Pulp wood exports not shown in this chart (see page 81) have held about steady to downward.

Much of the pulp formerly coming from Canada is now being absorbed in Canadian newsprint mills, coming into the United States as paper, rather than

pulp. Chemical pulps of the higher grade, however, are exported as semi-manufactures because of tariffs which largely prohibit their export in the form of finished high grade papers.

Sweden has long held the lead among the European countries as an exporter of pulp to the United States. Much of its tonnage is high grade chemical pulp. While the tonnage is increasing, there is a physical limit to Sweden's ability to supply in view of the nation's rigid and centuries-old forest policy of sustained yield.

Norway is but a steady contributor. Germany's exports are spasmodic. Its own demands are increasing and at that it draws much of its wood from beyond German territory.

Finland shows the most promise as tomorrow's big exporter of pulp. It has constructed several new mills of late and is rapidly expanding its tonnage.



# Pulp or Lumber?

A discussion\* of interest to all, but intended principally to answer a knotty problem before Pacific Coast loggers and lumbermen.

## "What Shall We Do With Our Western Hemlock?"

By L. A. De GUERE

Pulp and Paper Mill Engineer



ASIC facts are presented in this discussion with regard to the problem of wood pulp itself and with reference to its bearing, both present and future on the timber and lumber situation in a locality where the development of the pulp industry offers such great promise in these Pacific Northwest states. No doubt most of you have heard and read much on this subject both in favor

of and in opposition to it. Much is true on both sides. However, it is more than likely that these remarks and published articles have been colored more or less by the view point or the interest of the individual expressing them and these statements were sometimes made without sound reasoning, suggestions offered that were impractical, conclusions drawn that were erroneous and remarks made that were intended to trap the unwary or to discourage any effort and investment in a project of this kind.

I have read and heard much about the purported distress of the Western lumber and logging industry. From my information and observation I have tried to sift the wheat from the chaff and look at the matter from an unprejudiced view point, which I can do because I have no financial connection with the industry in any way. I am prepared to believe the lumber industry needs help in securing a commensurate return on investment, altho I have heard of comparatively few failures in recent years. It is true a number of mills have ceased operating but for other reasons than financial failures. However this may be, I feel that the lumber men and loggers could help themselves to greater profits by taking advantage of opportunities they have at their command, which they have either failed to understand or lacked the initiative to take advantage of or perhaps were not in financial position to do.

The returns on an investment in a pulp operation will vary, of course, with conditions the same as in any other line of business but there are possibilities in the business on the Pacific Coast that are well nigh unbelievable, altho not all pulp manufacturers are making more than ordinary profits. However, any plant properly located, built and managed should show a substantial profit. I do not intend to raise any false hopes or

make any statements that cannot be borne out, and it is far from my purpose to advocate the building of a pulp mill in conjunction with every saw mill operation on the Coast or imply that the pulp business is going to overshadow the lumber business here in a few years and be the means of making every sawmill and logging operation a financial success where it is not now and a greater success for those that are.

### A FEW POINTS IN SUMMARY

There is no overproduction of pulp in the United States today.

The West Coast can make suitable pulp for practically all purposes where wood pulp is used.

Pulp can be made here and sold in competition with foreign pulps at a profit.

There is sufficient standing timber here of pulp wood species to guarantee a long life to mills having several times the present output and this does not take into account woods waste or second growth timber which will eventually come into play.

The recent increase in West Coast output has had no effect on foreign importations of pulp and they are continuing to increase.

The paper industry originated in the East, gradually spread to the Middle West and is bound to become a business of major proportions on the Coast.

One thing that will hasten the development and make it more secure is a reduction in rail freight rates to Midwest points. The Panama Canal has made it possible to ship to East Coast points at a reasonable figure although still in excess of transportation costs from Europe.

A few years ago the Coast mills had a limited market due to population and transportation costs and also the Eastern mills were at that time manufacturing pulp and paper relatively cheap, but today the conditions are to a large extent reversed.

Today, with the aid of the Panama Canal, it is possible to put pulp and paper products on the East Coast and near inland points at a comparatively low transportation cost and with greatly increased cost of manufacture there as compared with much lower costs here, it has enabled the Coast mills to take advantage of a much wider market and this market should become better as time goes on. In addition to this the Midwest and Gulf states are taking more Coast paper products right along.

Pulp production can be discussed quite apart from the lumber business because, while allied, yet each of them can and has survived alone. The pulp business here at least could do so. However, there are extenuating circumstances surrounding the lumber industry here that perhaps have not faced the industry in other

\*From a paper read at joint dinner of TACOMA LUMBERMEN'S CLUB and Hemlock Section of WEST COAST LUMBERMEN'S ASSOCIATION, March 7, 1930, Winthrop Hotel, Tacoma, Washington.



similar localities. I refer to the hemlock problem which seems to be a source of a great deal of worry because the industry here has been built up on a basis of fir lumber and fir timber is still the greatest source of lumber supply. For this reason there is more occasion for the lumberman to seek some other outlet for his hemlock timber and anything that can be done to direct a part of the hemlock timber into other than lumber channels will automatically help the general lumber situation. I can see no object in stimulating uses of hemlock with a resulting lessening demand for fir.

The sale of waste wood from sawmill operations is not the final solution to the problem either because the waste wood now available is pretty well contracted for and the only way to increase its supply is to produce more lumber and this manifestly is just what you do not want to do. Furthermore, the sale of waste wood has not helped the log market or increased the price of lumber. It has been the means of bringing considerable revenue from a channel that formerly did not exist, but is not a big enough factor to affect the problem in a broad way.

#### Logs Too Cheap

All the waste wood available from last year's cut of hemlock would, if all salvaged, be about sufficient to provide the new pulp mills with their requirements, hence in order to dispose of more waste wood more sawmills will have to go on hemlock lumber and more pulp mills built to use the waste. It is not practical to get all the waste wood to existing pulp mills at a cost low enough to warrant its use as against logs, hence until logs are higher more or less of the waste will have to be sacrificed.

Much has been said about going into the woods before the big logs are taken out and taking out the small stuff, also going in afterwards and taking the leavings, broken logs, etc. At the present log prices, this has not proven profitable yet. The time may come when woods waste material can be handled profitably as compared to logs, but apparently no one has solved the problem to date. It is an unfortunate condition, as no doubt vast quantities of suitable material could be utilized for pulp, but until the demand for logs increases the market price, it does not seem probable that this material will be salvaged.

#### Sawmill

I read with a good deal of interest Mr. Anderson's\* recent article on this subject and believe an earnest effort should be made to work out the problem. An increased demand for logs and probable consequent rise in price will automatically make the salvaging of waste wood a possibility. Therefore, it would seem that your energies should be bent toward fostering an increased use of logs. While this may increase the cost of logs for pulp purposes, it will cause a trend toward salvaging what is now going to waste and still produce pulp wood at a relatively cheap figure.

Now about operating a sawmill in conjunction with a pulp mill, cutting only the high grade lumber from the log and diverting the balance to pulp. If by high grade hemlock lumber is meant the highest price lumber, there is so little of it in the log that I doubt seriously whether it would pay to bother with a sawmill operation in conjunction with a wood preparing department of a pulp mill. It might pay better to sell a few logs.

\*"How the Pulp Industry Will Change Pacific Coast Logging Methods," by Osian Anderson, President, Puget Sound Pulp & Timber Co., Pacific Pulp & Paper Industry, Vol. 3, No. 12, Nov. 1929.

If the log is used for pulp wood, the less it is cut up the better from the standpoint of volume of wood available, handling costs and character of chips produced. If the log is sawed into numerous sections in order to select the best for lumber an enormous amount of the log is wasted in saw dust, it increases the number of pieces to handle, also entails barking slabs and additional waste which does not occur when the whole log is used.



Mr. L. A. De Guere has been engaged in designing and building pulp and paper mills for 35 years, for 25 of these years in business for himself.

He has been connected with the building, rebuilding or expansion of 30 of the 58 mills in Wisconsin, as well as numerous other enterprises in other Eastern states and Canada, and in the past four years, on the Pacific Coast.

In his career he has seen pulp and paper manufacturing in Wisconsin grow from infancy to a position as a leading industry. He maintains offices both in Wisconsin Rapids, Wisconsin, and in Tacoma, Washington.

Furthermore it has been demonstrated that pulp produced from the whole log is superior to that produced from slabs. This question would have to be studied rather carefully to determine whether in the final analysis there is any advantage financially in a combined operation of this nature. A satisfactory pulp can be made from waste and is being done but its use is only warranted at present when it can be utilized right at the mill producing it or at least at no distance that entails a considerable transportation charge. The extra handling, loading, transportation and unloading may bring the cost up to the point where it is cheaper to use logs. Later conditions may change this.

However, a sawmill cutting a large quantity of hemlock, already having an established lumber market, can develop a very profitable business from the manufacture of pulp from waste wood in their own plant as they will undoubtedly have sufficient fuel that has no other value and this together with a combined ownership under one head makes a very attractive proposition. This is the type of combination where it is possible to show a 50% return on pulp mill investment, taking the waste wood at no value. Or give it any value such as is ordinarily being paid, the return will still be in the neighborhood of 40%.

There is being made in the states of Oregon and



Brubaker Aerial Surveys, Portland

Lumber is the leading commodity moving out of the Pacific Northwest, as is well illustrated here in a view of the Everett, Washington, waterfront, where lumber manufacture is the hub of the city's life. But the peak of lumber production seems to have been passed. Returns from the log on lumber alone are not satisfying, and the tendency is strongly toward further remanufacture of lumber products and pulp.

Washington at present a total of about 1960 tons of chemical wood pulp a day. Before the year is out the total for the two states will be 2260 tons per day. As there was produced in the United States in 1929 2,981,000 tons of chemical wood pulp, these two West Coast states produced just about 20% of the total production.

There was imported into the United States in 1929 about 1,420,000 tons of all classes of chemical pulp—about one-third of the total usage and nearly one-half of the United States' production. Much of the pulp produced on the Coast is used in paper products made at the producing mills, but by the latter part of 1929 this Coast will be providing over 1000 tons of pulp per day for Eastern markets. This is truly remarkable when you consider that five years ago there was not a pound of pulp for sale on the open market from this locality. I look to see another 1000 tons per day for sale from the Pacific Coast in another five years and fully expect to see at least 2000 tons per day more pulp manufactured here than there is at present, and it would not surprise me if at that time the importations will be as great or greater than at present.

With all the increased production of pulp in the South and on the Pacific Coast in the last few years imports have not been affected. It is true that production of chemical pulp has been falling off in other parts of the United States but the new production has increased faster than the loss. The West offers the best opportunities for an increase in pulp production with the assurance of the business being on a sound footing for as long as there is timber left—which will not be in any grown up man's lifetime. Long after saw-mills cease to flourish here, pulp and paper mills will continue to operate and draw their pulp wood supplies from reasonably nearby locations. This has been true of Wisconsin, Minnesota and Michigan, as well as some Eastern states, and will be just as true here. Pulp timber may not always be as cheap but when it becomes

as expensive as it is in the Middle West and East, it will be prohibitive in those places.

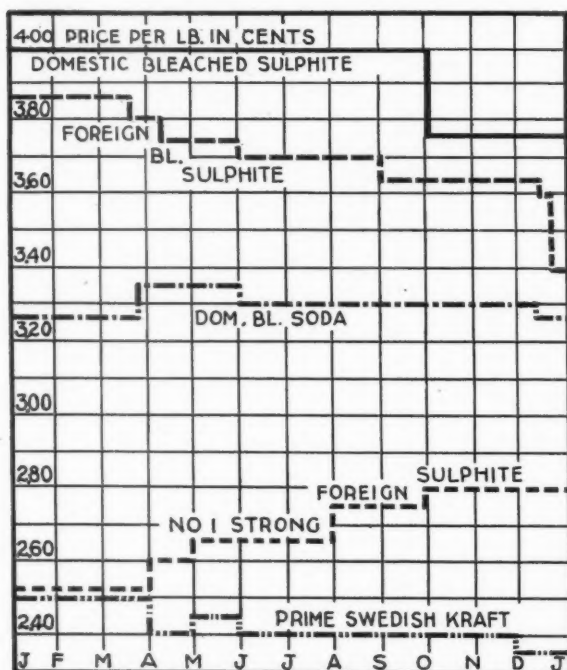
Sulphite pulp usage has increased at an average of 5% per year from 1922 to date. Assuming the importations bear the same ratio to this increase as they do to the present domestic production—which is about one-half—this means at least 150 tons per day of new production every year from this country without disturbing the present imports at all, and letting the imports increase also. While this refers to sulphite pulp only, kraft pulp can be manufactured here to advantage also, and there is no reason, therefore, why the total production should not increase much beyond this figure without any danger of overproduction. Sulphite pulp exports from the United States increased from 22,000 tons in 1928 to 40,000 tons in 1929.

In addition, there is the problem of Eastern pulp mills closing down. Many are bound to do in the future what others have done in the past. I can name plants aggregating 200 tons capacity that have gone out of production in the last two years in Wisconsin and Michigan and know of others that are likely to quit in the next few years. The ever widening use of paper for new products demands a steady increase of wood pulp production.

For the next 30 years you will see the paper pulp business grow and flourish on the West Coast and it will continue to operate successfully for a long time after that, but it is likely by that time it will be necessary to seek other localities for the great increase in requirements that will be called for as I look forward not only to a constant increase in demand in this country but in other countries now not favorably situated for the production of pulp and who are importing most if not all of their requirements.

In Wisconsin more money has been taken off of

logged off lands for pulp wood than ever was possible in saw timber. Such conditions will exist out here in the future as suitable pulp timber can be grown here in 25 to 30 years, and if compared to some spruce pulp logs coming into Wisconsin, 10 to 15 years.



RANGE OF PULP PRICES—1929

In cents per pound ex-dock New York and f. o. b. pulp mills as quoted in The Daily Mill Stock Reporter, New York

This entire matter should be viewed in a broad way not as to what is taking place today or likely to take place tomorrow but what the situation is going to be 10, 20 or 30 years from today. You will find the pulp and paper mills here today in a much better position ten years from now than they are at present because the demand for their products will have greatly increased while the source of supply will not.

If you will scrutinize the activities of some of the concerns who have been building mills out here in recent years it is apparent they are not expecting to go out of business in a few years and, further, that they would not be so zealous about new installations if there were only ordinary profits in the business. They fully realize the strategic position of the Pacific Coast in this industry and they are not leaving a stone unturned to take advantage of it.

Do not, however, let yourselves be overwhelmed by the magnitude of their activities, thinking no one can accomplish anything in the industry in a comparatively small way. The amount of pulp they will have on the market this year is less than 3% of the total consumed in the United States so there are plenty of other prospective customers. The very fact of the enormous investments in some of these mills is the best indication of the possibilities in the business here, as unless the profits were known to be unusually large they could not and would not have invested in so large a scale nor so high a price per ton of output.

What then are you to do with hemlock timber? I say put a portion of your logs directly into pulp, select your logs if you will to sell or saw for lumber but keep as much of the logs as you can out of the sawmill. Pool your interests if necessary to accomplish this and put

your No. 3 lumber into pulp if there is no profitable sale for it. Two thousand feet of lumber will make a ton of pulp and if you cannot get over \$5.00 per thousand for the lumber, put it into pulp. Inasmuch as it is clean it will be well worth the price and will yield a profit.

What about the quality of pulp produced on the Coast? Kraft pulp produced here can be made into a sheet of paper equal to anything on the market today. As for sulphite, one of the Eastern mills known for exceptionally high grade papers is now operating a mill here using Pacific Coast bleached sulphite. Others in the East are buying this pulp and putting it into high grade papers. Eastern manufacturers of high grade papers have become interested financially in some of the new mills being erected with the expectation of using their pulp in their present mills. Unbleached pulps are being shipped into Eastern and Middle West mills and finding a ready market. Sulphite pulps made on the Coast may not yet equal the best grade of foreign pulps, but they no doubt will be improved. Western pulps have found a market, whether or not they have displaced foreign pulps.

#### Cost of Operation

How large will a mill have to be to pay? A 50-ton mill will pay under the right conditions, but a 75-ton mill will pay better and a 100-ton mill still better. The investment cost per ton is higher in a 50-ton than in a 100-ton mill, thereby making fixed charges per ton of pulp higher with a lower production. Also the operating cost is higher because about the same number of men can run a 75-ton mill that it takes to run a 50-ton mill and only a few more men in a 100-ton mill, so that the labor and superintendence cost will be less in the larger mill. There is not as great a difference between the 75- and 100-ton mill as there is between the 75- and 50-ton mill, hence it would seem the part of wisdom to start with not less than a 75-ton mill.

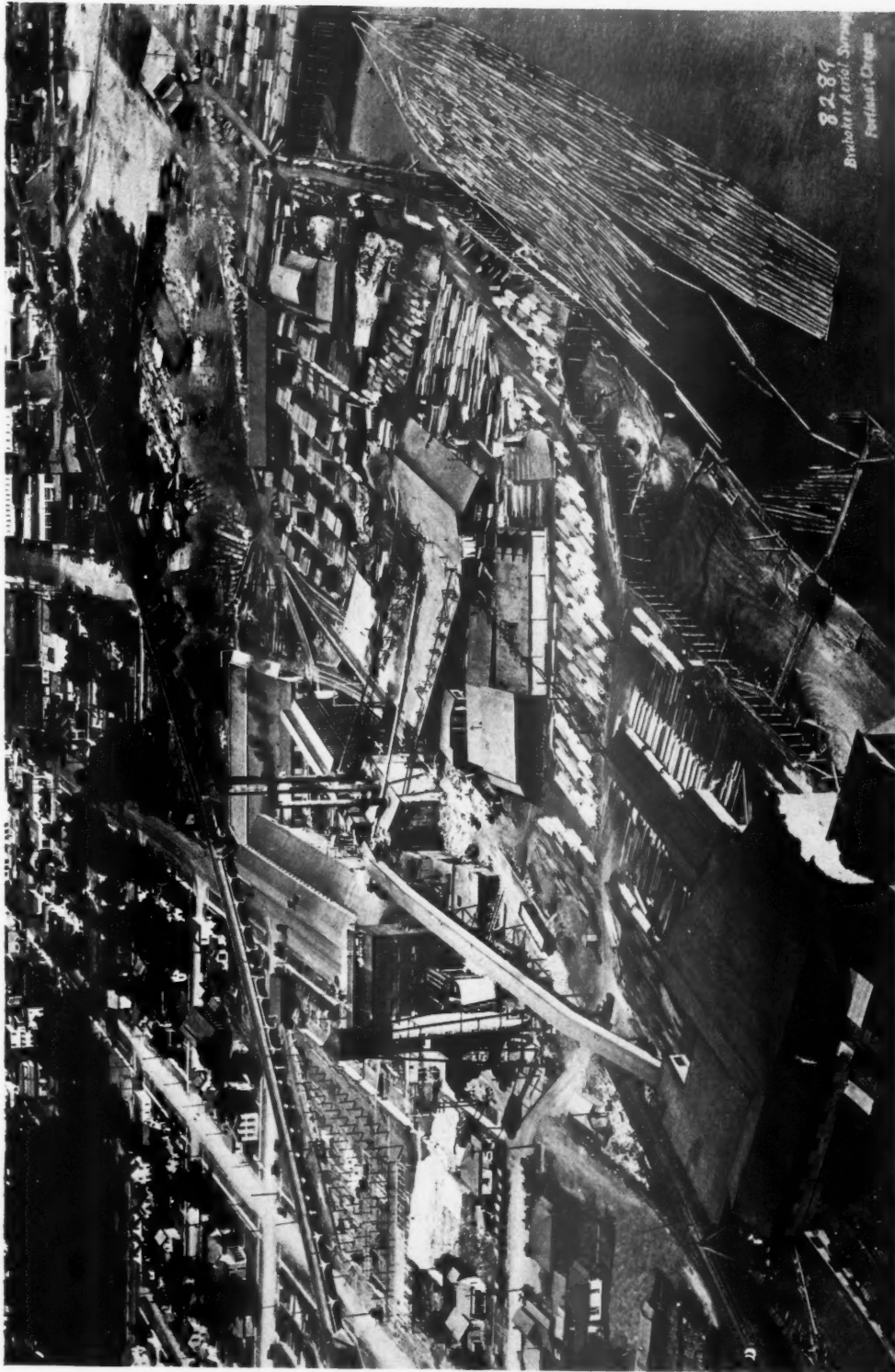
What will it cost to build? Mills, like homes or automobiles, may cost any price, but there is a reasonable minimum and a prohibitive maximum. No mill should be built with shoddy equipment or set on improper foundations but beyond that there is a wide leeway. You can make just as much and just as good pulp in a wooden structure as otherwise. However, the building cost is the smaller part of the cost of the plant and if you want something that looks more imposing and may have a longer life build of steel, concrete, tile or brick.

Exclusive of working capital and financing cost, mills of this character can be built for from \$10,000 to \$15,000 per ton, depending on whether sulphate or sulphite and whether a bleaching plant is also installed and whether full steam and power generating installations are included or not, and also the capacity of the plant. These are rough figures and actual cost will depend on location and various other factors. It has been said that such a mill cannot be built for less than \$20,000 to \$25,000 per ton but I know something about the cost of mills, having built many of them. I believe there is a happy medium where it pays to stop. Any mill so built that it will be in need of constant repairs because of poor equipment, material or design is not a profitable proposition, while on the other hand money spent uselessly on buildings and equipment is a burden forever on earnings of the company.

How are you going to sell the pulp? Most of your lumber is sold thru brokers and you can sell your pulp

(Turn to page 82)





Brubaker Aerial Surveys, Portland

# VANCOUVER, WASHINGTON

The Columbia River Paper Mills, one of the Leadbetter group, was a pioneer on the Coast in the idea that the sawmill and pulp mill ought to be under one management. The company operates a complete sawmill, cuts out the better lumber, and passes the residue to the pulp mill, where it is converted to sulphite, groundwood pulp and fuel. The mill has two paper machines.

8289  
Brubaker Aerial Surveys  
Portland, Oregon

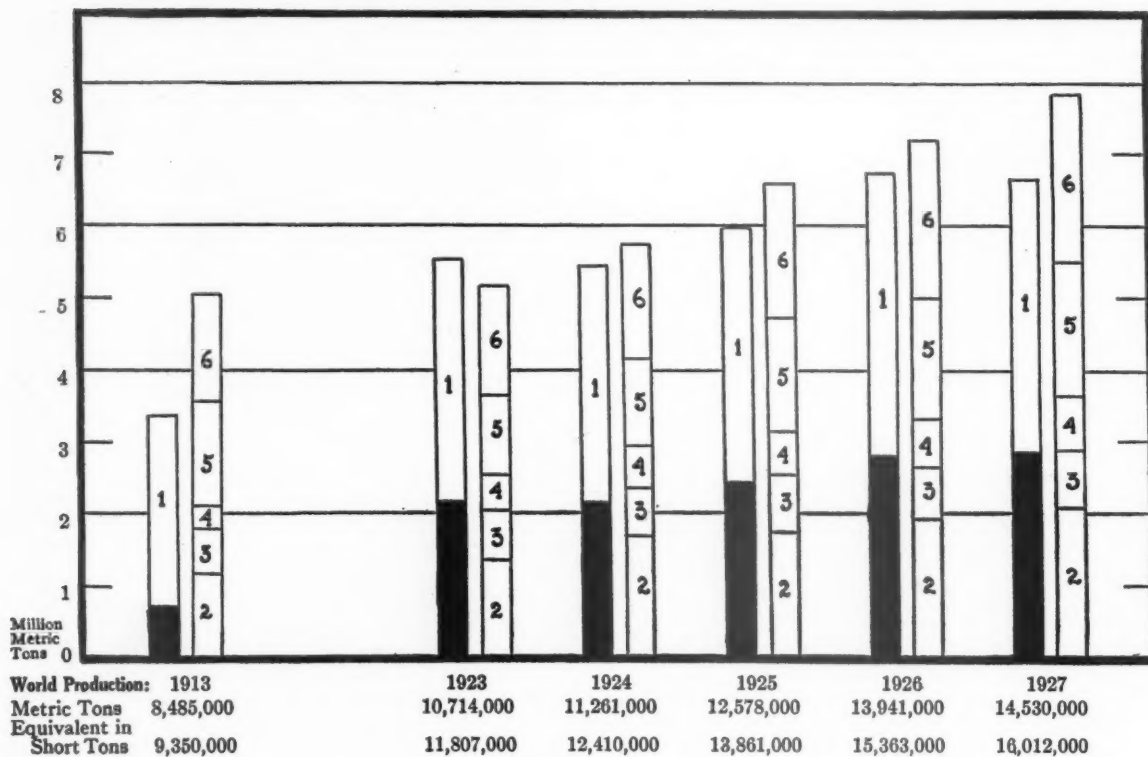


### WORLD'S PRODUCTION OF WOOD PULP (1913; 1923-27)

A chart prepared by the Canadian Bank of Commerce from figures collected by the League of Nations.

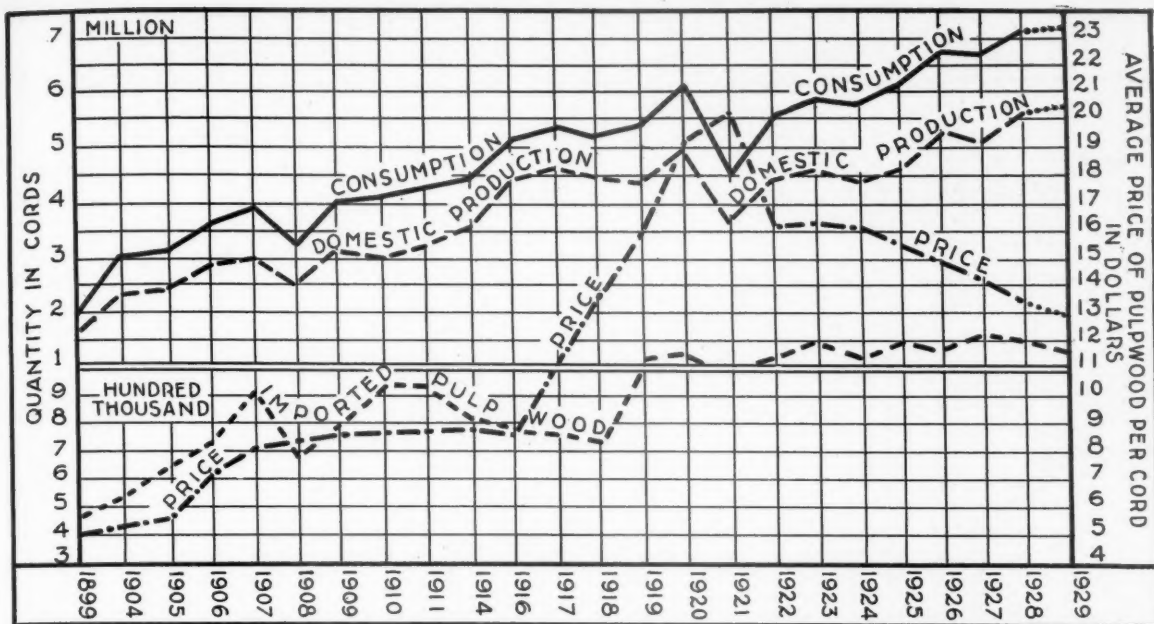
Black Bar—Canadian Production. That of the other countries is indicated as follows:

1—United States; 2—Sweden; 3—Norway; 4—Finland; 5—Germany; 6—All others.



### World's Production of Paper, including Paper Board (Metric Tons)

| Country                  | 1913              | 1925              | 1926              | 1927              |
|--------------------------|-------------------|-------------------|-------------------|-------------------|
| <b>North America</b>     | 5,350,000         | 10,128,000        | 10,825,000        | 10,822,000        |
| Canada                   | 550,000           | 1,710,000         | 2,055,000         | 2,240,000         |
| United States            | 4,780,000         | 8,330,000         | 8,600,000         | 8,400,000         |
| Newfoundland             | 20,000            | 88,000            | 169,000           | 182,000           |
| <b>Asia</b>              | 133,000           | 569,000           | 585,000           | 605,000           |
| British India            | 28,000            | 29,000            | 30,000            | 30,000            |
| Japan                    | 105,000           | 540,000           | 555,000           | 575,000           |
| <b>Europe</b>            | 5,937,000         | 6,895,000         | 6,975,000         | 7,725,000         |
| Germany                  | 1,981,000         | 2,058,000         | 1,991,000         | 2,438,000         |
| Austria                  | 258,000           | 241,000           | 252,000           | 267,000           |
| Belgium                  | 169,000           | 150,000           | 171,000           | 179,000           |
| Denmark                  | 42,000            | 46,000            | 52,000            | 53,000            |
| Estonia                  | 15,000            | 36,000            | 33,000            | 40,000            |
| Finland                  | 227,000           | 314,000           | 312,000           | 330,000           |
| Greece                   |                   | 3,000             | 3,000             | 5,000             |
| Italy                    | 260,000           | 400,000           | 375,000           | 350,000           |
| Norway                   | 194,000           | 340,000           | 308,000           | 374,000           |
| Netherlands              | 234,000           | 323,000           | 336,000           | 350,000           |
| Poland                   | 65,000            | 91,000            | 94,000            | 128,000           |
| Roumania                 | 18,000            | 29,000            | 33,000            | 35,000            |
| United Kingdom           | 1,076,000         | 1,307,000         | 1,307,000         | 1,307,000         |
| Russia (U.S.S.R.)        | 350,000           | 100,000           | 175,000           | 301,000           |
| Serb-Croat-Slovene State | 20,000            | 25,000            | 32,000            | 42,000            |
| Sweden                   | 333,000           | 557,000           | 598,000           | 610,000           |
| Switzerland              | 70,000            | 95,000            | 102,000           | 106,000           |
| Czechoslovakia           | 125,000           | 180,000           | 201,000           | 210,000           |
| Other Countries          | 500,000           | 600,000           | 600,000           | 600,000           |
| <b>World</b>             | <b>11,420,000</b> | <b>17,592,000</b> | <b>18,385,000</b> | <b>19,152,000</b> |



PULPWOOD CONSUMPTION OF THE UNITED STATES—1899 to 1929  
Showing Domestic Production, Wood Imports, and Average Prices per Cord

PULPWOOD CONSUMED BY THE UNITED STATES  
AND AVERAGE PRICE PER CORD—1899 to 1929  
(Quantities in Cords)

| Year | Total Consumption | Domestic Production | Imported   | Average Price Per Cord |
|------|-------------------|---------------------|------------|------------------------|
| 1929 | 7,500,000*        | 6,150,000           | 1,350,722  | —                      |
| 1928 | 7,160,100         | 5,617,100           | 1,543,000  | \$13.55                |
| 1927 | 6,750,935         | 5,154,935           | 1,596,000  | 14.14                  |
| 1926 | 6,766,007         | 5,382,388           | 1,383,619* | 14.96                  |
| 1925 | 6,093,821         | 4,610,590           | 1,483,231* | 15.48                  |
| 1924 | 5,768,082         | 4,488,107           | 1,279,975* | 16.07                  |
| 1923 | 5,872,870         | 4,524,870           | 1,348,000  | 16.23                  |
| 1922 | 5,548,842         | 4,498,808           | 1,050,034  | 16.20                  |
| 1921 | 4,557,179         | 3,740,406           | 816,773    | 16.20                  |
| 1920 | 6,114,072         | 5,014,513           | 1,099,559  | 20.10                  |
| 1919 | 5,477,832         | 4,445,817           | 1,032,015  | 19.03                  |
| 1918 | 5,250,794         | 4,506,276           | 744,518    | 15.95                  |
| 1917 | 5,480,075         | 4,706,327           | 773,748    | 13.93                  |
| 1916 | 5,228,558         | 4,444,565           | 783,993    | 11.10                  |
| 1914 | 4,470,763         | 3,641,063           | 829,700    | 8.76                   |
| 1911 | 4,328,052         | 3,390,382           | 937,670    | 8.81                   |
| 1910 | 4,094,306         | 3,146,540           | 947,766    | —                      |
| 1909 | 4,001,607         | 3,207,653           | 793,954    | 8.62                   |
| 1908 | 3,346,953         | 2,651,817           | 695,136    | 8.38                   |
| 1907 | 3,962,660         | 3,037,287           | 925,373    | 8.17                   |
| 1906 | 3,661,176         | 2,922,304           | 738,872    | —                      |
| 1905 | 3,192,223         | 2,546,795           | 645,428    | —                      |
| 1904 | 3,050,717         | 2,477,099           | 573,618    | 6.82                   |
| 1899 | 1,986,310         | 1,617,093           | 369,217    | 4.95                   |

\*Estimated.

Source: Figures for years 1899 to 1922 from United States Department of Agriculture, Bulletin 1241. For years 1923 to 1928, compiled from statistics of Department of Commerce, Bureau of the Census, Forest Products, 1928, and Foreign Commerce and Navigation of the United States. Domestic production for the years 1923 to 1929 is computed by subtracting imports from consumption.

### U. S. Figures Reveal 1928 Production-Consumption Gains For Coast Pulp Mills

Figures released by the Department of Commerce, collected in cooperation with the Department of Agriculture, show that the state of Washington far outstripped all other states in pulpwood consumption and wood pulp production gains during 1928. Washing-

ton produced 349,107 tons of wood pulp, a gain of 80,758 tons over the 1927 production of 268,349 tons; and consumed 651,657 cords of pulpwood, a gain of 205,993 cords over the 1927 consumption of 445,664 cords.

Oregon and California also showed gains and stepped ahead of Minnesota for pulpwood consumption. The two states consumed 308,264 cords of pulpwood, a gain of 41,029 cords over the 1927 consumption; and held seventh place for wood pulp production with a total of 213,407 tons, a net gain of 12,538 tons over 1927.

The total United States consumption of pulpwood in 1928 amounted to 7,160,100 cords, reported by 204 mills. This figure represents an increase of 6.1 per cent as compared with the consumption in 1927—6,750,935 cords, reported by 219 mills. The total production of wood pulp in 1928 was 4,510,800 tons, an increase of 4.6 per cent as compared with 4,313,403 tons in 1927.

TABLE 1.—PULPWOOD CONSUMED AND WOOD PULP PRODUCED, BY STATES: 1928 AND 1927

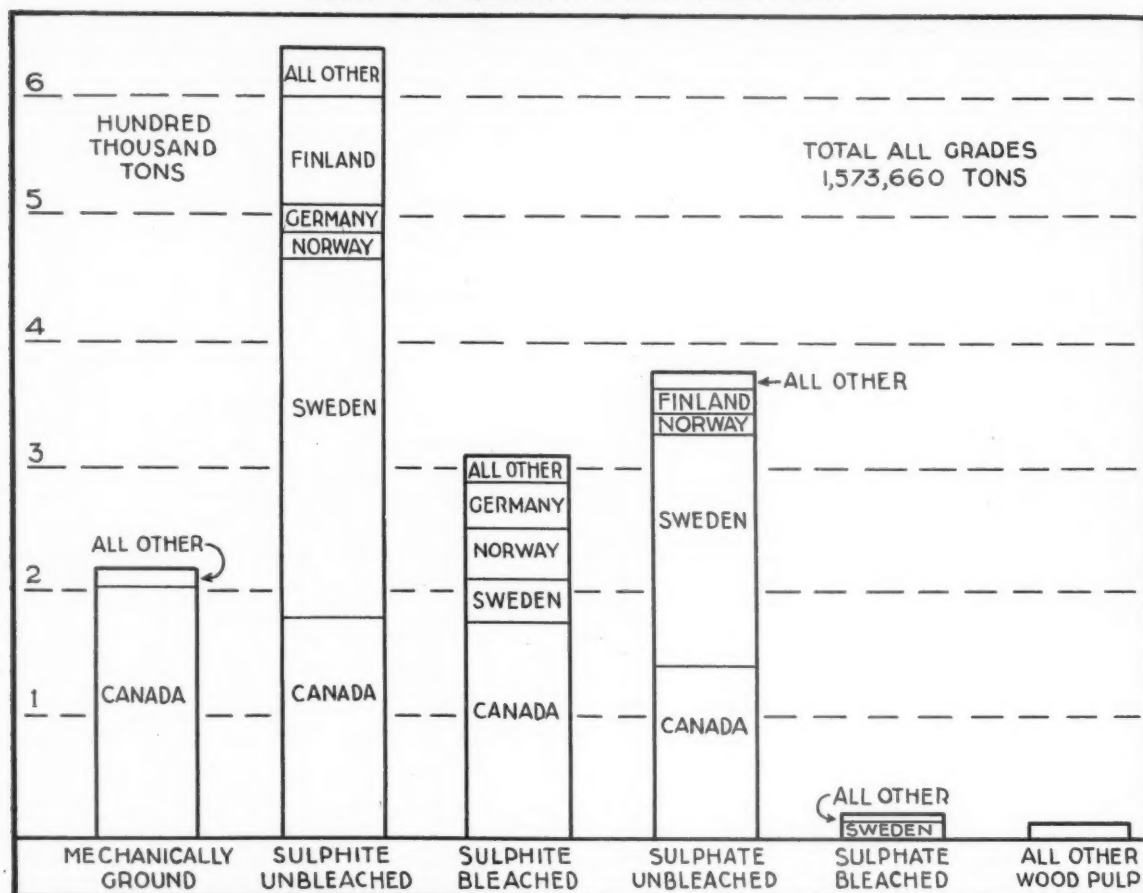
(This table gives statistics for all states for which separate figures can be shown without disclosing operations of individual establishments. Certain of the "Other States", however, reported larger amounts of pulpwood consumed and of wood pulp produced than some of the states shown separately.)

|                                    | Pulpwood consumed (Cords) |           | Wood pulp produced (Tons of 2,000 lbs.) |           |
|------------------------------------|---------------------------|-----------|---|-----------|
|                                    | 1928                      | 1927      | 1928                                    | 1927      |
| United States                      | 7,160,100                 | 6,750,935 | 4,510,800                               | 4,313,403 |
| Maine                              | 1,309,988                 | 1,273,268 | 970,690                                 | 942,162   |
| Wisconsin                          | 1,225,630                 | 1,199,615 | 720,781                                 | 690,921   |
| New York                           | 802,115                   | 872,780   | 633,182                                 | 710,227   |
| Washington                         | 651,657                   | 445,664   | 349,107                                 | 268,349   |
| Louisiana                          | 413,602                   | 349,272   | 226,708                                 | 179,878   |
| Pennsylvania                       | 405,276                   | 398,021   | 218,598                                 | 216,587   |
| New Hampshire                      | 351,349                   | 358,376   | 198,587                                 | 200,324   |
| Virginia                           | 342,813                   | 316,032   | 189,925                                 | 170,630   |
| Michigan                           | 331,697                   | 351,688   | 196,203                                 | 193,539   |
| Oregon and California <sup>1</sup> | 308,264                   | 267,235   | 213,407                                 | 200,869   |
| Minnesota                          | 282,691                   | 281,156   | 194,399                                 | 191,220   |
| Massachusetts                      | 51,325                    | 49,473    | 32,370                                  | 31,822    |
| Vermont                            | 20,081                    | 31,795    | 19,831                                  | 32,562    |
| Other States <sup>2</sup>          | 663,612                   | 556,560   | 347,012                                 | 284,313   |

<sup>1</sup>Combined in order to avoid disclosing quantities reported by individual establishments.

<sup>2</sup>1928—Arkansas, Delaware, District of Columbia, Maryland, Mississippi, New Jersey, North Carolina, Ohio, South Carolina, Tennessee, Texas and West Virginia; 1927—Delaware, District of Columbia, Maryland, Mississippi, North Carolina, Ohio, South Carolina, Tennessee, Texas and West Virginia.

**PACIFIC PULP & PAPER INDUSTRY**  
**WOOD PULP IMPORTED BY UNITED STATES**  
 By Grades and Countries of Origin  
 Based on U. S. Department of Commerce Statistics for 1928



**UNITED STATES WOOD PULP IMPORTS**

By Grades and Countries of Origin, 1928  
 (In Tons of 2,000 Lbs.)

| Imported From    | Mechanically Ground | Unbleached Sulphite | Bleached Sulphite | Unbleached Sulphate | Bleached Sulphate | All Other Wood Pulp |
|------------------|---------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
| Finland .....    | 11,273              | 92,778              | 1,500             | 28,843              | 3,296             | 100                 |
| Germany .....    | 126                 | 23,933              | 39,592            | 1,093               | 197               | 428                 |
| Norway .....     | 5,233               | 23,456              | 40,212            | 15,214              | 547               | .....               |
| Sweden .....     | 2,286               | 297,130             | 36,237            | 193,145             | 8,612             | 2,797               |
| Canada .....     | 202,382             | 197,751             | 176,807           | 139,945             | 1,834             | 3,074               |
| All Others ..... | 1,199               | 23,612              | 13,578            | 3,016               | 104               | 329                 |
| Total .....      | 222,499             | 640,660             | 307,926           | 381,256             | 14,590            | 6,728               |

Source: United States Department of Commerce, Foreign Commerce and Navigation of the United States, 1928.

**Pulp or Lumber**

(Continued from page 78)

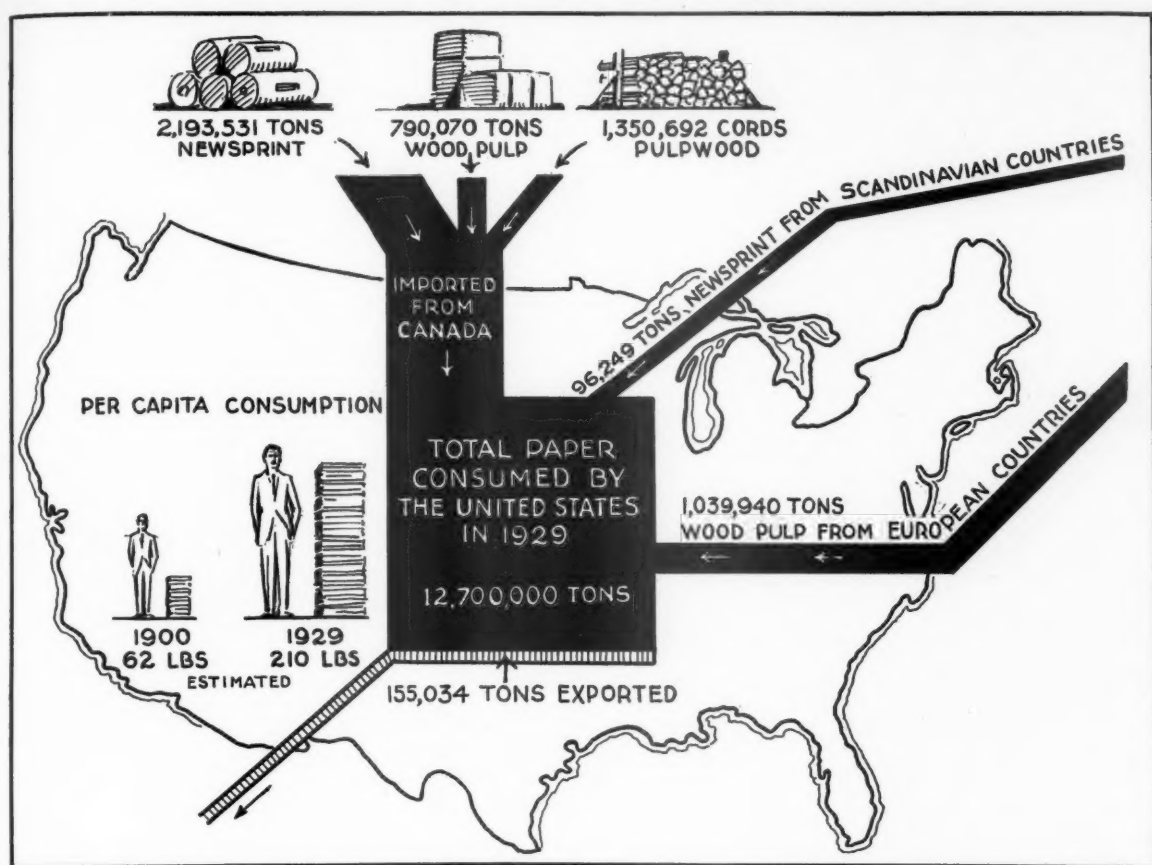
exactly the same way. There may be some difficulty getting new outputs established but it has been done with all pulp offered for sale to date from the Pacific Coast.

What are the possibilities for profit in the business? Briefly with a 50-ton rated mill making 57 tons per day you might expect a profit of \$8.61 per ton with wood at \$12 M and pulp selling at \$54 delivered Wisconsin and Michigan, an 86-ton mill—\$10.88, a 115-ton mill—\$11.33 per ton. About .3 cord of clean wood can

be obtained from every 1000 ft. logs cut, hence if you are cutting 300 M ft. logs per day of 24 hrs. you should get 90 cords or enough to make 40 tons of pulp per day and the balance, if needed, can be supplied from low grade logs or lumber so that the average cost of wood per ton of pulp in an 85-ton mill should not be over \$9 per ton. After making a due allowance for extra labor should show a net saving of about \$2 per ton over previous figures or a gain in returns of \$52,000 per year, whereas if you can supply all the waste wood required for such a mill, the saving should be in the neighborhood of \$140,000 over previous figures, making the return on the investment net \$356,000 after allowing \$1 per unit for all hogged fuel furnished, \$2 per cord for wood in the conveyor based on number of cords clean wood produced and including 6% interest on the total investment or a net return of about 32%. You can readily appreciate under such conditions a drop in the price of pulp is not going to put you out of business.

In Washington the average price of wood in 1928 was given as \$7.34. Wood costs were much higher in 1920 and 1921. It requires about two cords of wood to produce a ton of pulp. The wood cost per ton of pulp in some Eastern localities is prohibitive in some instances and it is difficult to understand how some mills can exist. As it is likely costs will gradually go higher it seems plausible that many of the Eastern mills

(Turns to page 94)



TOTAL PAPER CONSUMED BY UNITED STATES—1929  
Showing Dependency of Nation Upon Foreign Supplies of Paper, Wood Pulp, and Pulpwood

### In Explanation of America's Paper Appetite

The chart above is intended to aid in the visualization of the total paper consumption of the United States and the sources of supply from which the nation must draw to satisfy its enormous demands.

The two small figures at the left show comparatively how growth of paper consumption per capita has in the past quarter century far outstripped the growth in population.

The growth in per capita consumption has come about in several ways: in the publishing of more and larger newspapers; in the general increase in size of advertisements in respect to space used and appropriations made; in the growth of the publishing business in general; in the widespread increase in the use of paper products for wrapping, individual containers, shipping cases, and kindred uses.

In the total consumption the percentage of papers made from other than wood pulps is comparatively negligible. Consequently the total consumption is a fair gauge on the wood requirements of the industry. This refers, however, only to papers using new pulp.

To get a truer picture of just how dependent the United States is upon outside sources it must be remembered that some 40% of the total consumption is paperboard, used principally in making paper containers. In manufacturing paperboard much waste paper is re-used. Of the total consumption of 12,700,000 tons, 40% would represent roundly 5,000,000

tons. Assuming that a large percentage of these 5,000,000 tons represented reclaimed paper, the significance of the imported wood, pulp, and paper is all the more apparent.

### PAPER CONSUMED IN THE UNITED STATES 1899 to 1929—(In Tons of 2,000 lbs.)

| Year— | Total Consumption | Domestic Production | Imports*  | Exports* |
|-------|-------------------|---------------------|-----------|----------|
| 1899  | 2,158,000         | —                   | —         | —        |
| 1904  | 3,050,000         | —                   | —         | —        |
| 1909  | 4,224,000         | 4,216,708           | —         | 36,093   |
| 1914  | 5,496,000         | 5,270,047           | 343,306   | 65,850   |
| 1917  | 6,256,000         | 5,919,647           | 562,903   | 168,928  |
| 1918  | 6,387,000         | 6,051,523           | 600,445   | 176,298  |
| 1919  | 6,493,000         | 6,190,361           | 630,281   | 224,416  |
| 1920  | 7,861,000         | 7,334,614           | 734,967   | 124,079  |
| 1921  | 6,054,000         | 5,356,317           | 799,273   | 49,926   |
| 1922  | 8,003,000         | 7,017,800           | 1,068,835 | 99,487   |
| 1923  | 9,387,000§        | 8,100,000§          | 1,376,847 | 88,997   |
| 1924  | 9,521,000§        | 8,200,000§          | 1,414,969 | 93,825   |
| 1925  | 10,571,000        | 9,182,204           | 1,486,338 | 96,964   |
| 1926  | 11,769,000        | 10,000,000          | 1,890,826 | 117,691  |
| 1927  | 11,905,000        | 10,002,000          | 2,009,645 | 106,516  |
| 1928  | 12,329,000        | 10,403,000          | 2,189,882 | 122,591  |
| 1929  | 12,700,000§       | 10,984,000§         | 2,433,000 | 155,000  |

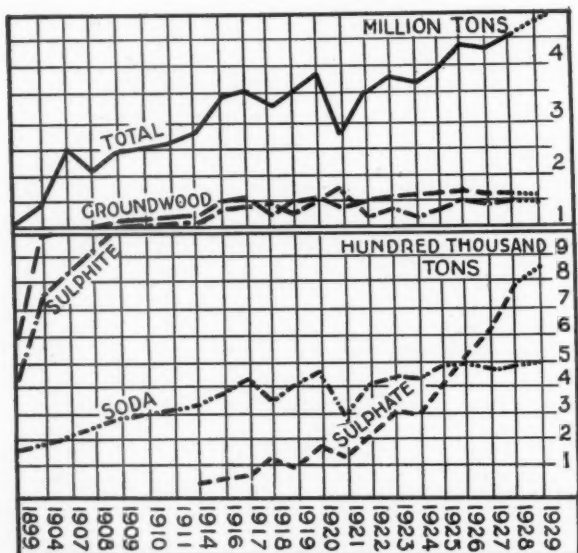
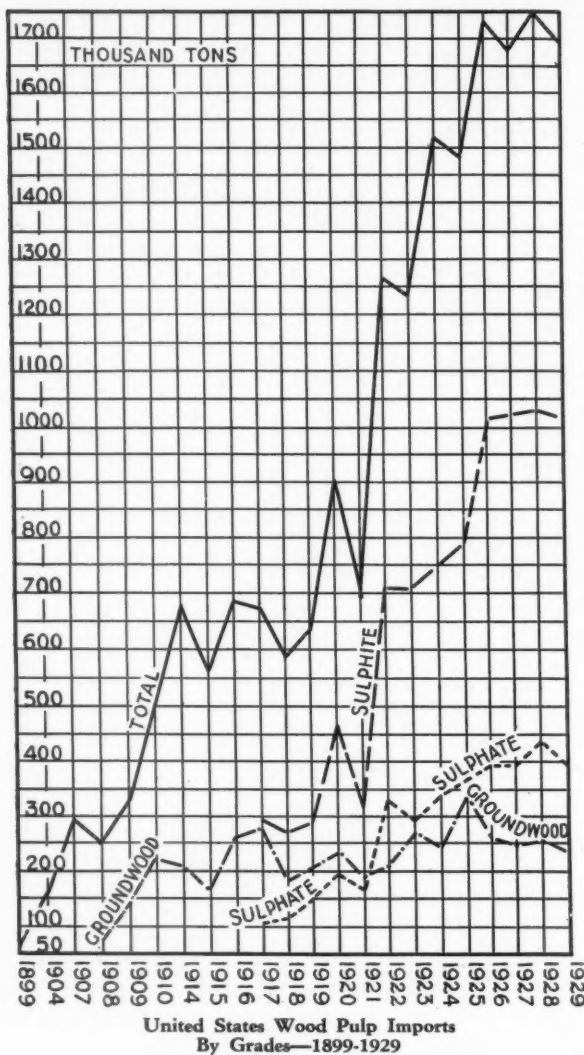
\*Includes only printing paper, newsprint and wrapping paper.

\*Figures for 1909 to 1917 are by fiscal years ending June 30; by calendar years from 1917 to 1929.

§Estimates by American Paper and Pulp Association.

Source—Compiled by Pacific Pulp and Paper Industry from the following: United States Department of Agriculture, Bulletin No. 1241; United States Department of Commerce, Foreign Commerce and Navigation of the U. S., and Census of Manufactures for 1927; American Paper and Pulp Association Figures.





## WOOD PULP IMPORTED BY THE UNITED STATES

1899 to 1929

(In Tons of 2,000 Lbs.)

| Year | Total     | Groundw'd | Total Sulphite | Total Sulphate |
|------|-----------|-----------|----------------|----------------|
| 1929 | 1,679,222 | 244,162   | 1,035,691      | 399,369        |
| 1928 | 1,734,790 | 249,199   | 1,062,243      | 443,348        |
| 1927 | 1,675,718 | 245,599   | 1,035,985      | 394,134        |
| 1926 | 1,731,413 | 303,759   | 1,034,590      | 393,064        |
| 1925 | 1,483,614 | 331,092   | 790,211        | 362,311        |
| 1924 | 1,522,715 | 245,920   | 934,403        | 342,392        |
| 1923 | 1,228,982 | 267,194   | 712,533        | 249,255        |
| 1922 | 1,258,961 | 215,811   | 712,088        | 330,337        |
| 1921 | 697,100   | 190,744   | 328,270        | 178,086        |
| 1920 | 906,297   | 233,148   | 473,175        | 199,974        |
| 1919 | 636,016   | 202,253   | 282,707        | 151,056        |
| 1918 | 578,209   | 185,478   | 270,211        | 122,520        |
| 1917 | 677,841   | 279,073   | 289,210        | 109,558        |
| 1916 | 683,765   | 262,517   | .....          | .....          |
| 1915 | 568,379   | 174,056   | .....          | .....          |
| 1914 | 675,564   | 217,256   | .....          | .....          |
| 1913 | 541,455   | 167,889   | .....          | .....          |
| 1912 | 539,790   | 185,443   | .....          | .....          |
| 1911 | 562,424   | 262,681   | .....          | .....          |
| 1910 | 506,776   | 224,184   | .....          | .....          |
| 1909 | 370,023   | 145,362   | .....          | .....          |
| 1908 | 250,485   | 71,217    | .....          | .....          |
| 1907 | 296,778   | .....     | .....          | .....          |
| 1906 | 199,702   | .....     | .....          | .....          |
| 1905 | 170,867   | .....     | .....          | .....          |
| 1904 | 179,324   | .....     | .....          | .....          |
| 1899 | 57,335    | .....     | .....          | .....          |

<sup>1</sup> Includes 725 tons of soda September to December only.<sup>2</sup> Includes 100,535 tons of wood pulp, grade unclassified, imported Jan. 1 to June 30.<sup>3</sup> July 1 to Dec. 31.

Source: Figures for 1929 from Monthly Summary of Foreign Commerce of the United States, December, 1929, from Department of Commerce, Bureau of Foreign and Domestic Commerce. For 1923 to 1928, Department of Commerce, Bureau of the Census. Figures for the year 1899 to 1922 from United States Department of Agriculture, Bulletin No. 1241.

TOTAL UNITED STATES DOMESTIC WOODPULP PRODUCTION  
BY GRADES, FROM 1899 TO 1928

In Tons of 2,000 Lbs.

| Year | Total     | Groundwood | Sulphite  | Soda    | Sulphate |
|------|-----------|------------|-----------|---------|----------|
| 1928 | 4,510,800 | 1,615,689  | 1,595,951 | 488,641 | 780,552  |
| 1927 | 4,313,403 | 1,618,638  | 1,588,132 | 487,478 | 607,172  |
| 1926 | 4,394,766 | 1,774,192  | 1,599,776 | 496,920 | 523,878  |
| 1925 | 3,962,217 | 1,629,689  | 1,447,191 | 472,647 | 412,690  |
| 1924 | 3,723,266 | 1,643,283  | 1,336,551 | 440,697 | 302,735  |
| 1923 | 3,788,672 | 1,580,553  | 1,448,690 | 445,162 | 314,267  |
| 1922 | 3,521,644 | 1,483,787  | 1,374,319 | 419,857 | 243,681  |
| 1921 | 2,875,601 | 1,267,382  | 1,166,926 | 300,533 | 140,760  |
| 1920 | 3,821,704 | 1,583,914  | 1,585,834 | 463,305 | 188,651  |
| 1919 | 3,517,952 | 1,518,829  | 1,419,829 | 411,693 | 120,378  |
| 1918 | 3,313,861 | 1,364,504  | 1,456,633 | 350,362 | 142,362  |
| 1917 | 3,509,939 | 1,535,953  | 1,451,757 | 437,430 | 84,799   |
| 1916 | 3,435,001 | 1,508,139  | 1,466,402 | 387,021 | 73,439   |
| 1914 | 2,893,150 | 1,293,661  | 1,151,327 | 347,928 | 52,641   |
| 1911 | 2,686,134 | .....      | .....     | .....   | .....    |
| 1910 | 2,533,976 | .....      | .....     | .....   | .....    |
| 1909 | 2,495,523 | 1,179,266  | 1,017,631 | 298,626 | .....    |
| 1908 | 2,118,947 | .....      | .....     | .....   | .....    |
| 1907 | 2,547,879 | .....      | .....     | .....   | .....    |
| 1904 | 1,921,768 | 968,976    | 756,976   | 196,770 | .....    |
| 1899 | 1,179,525 | 586,374    | 416,037   | 177,114 | .....    |

\*Not reported separately.

<sup>1</sup>Includes data for screenings, as follows: Mechanical, 4,701 tons; sulphite, 37,093; sulphate, 6,327.<sup>2</sup>Includes data for screenings, as follows: Mechanical, 8,229 tons; sulphite, 35,433; sulphate, 3,919.<sup>3</sup>Includes data for screenings as follows: Mechanical, 9,944 tons; sulphite, 41,601; sulphate, 3,918.<sup>4</sup>Includes data for screenings as follows: Mechanical, 17,670 tons; sulphite, 44,105; sulphate, 2,922.<sup>5</sup>Includes data for some screenings.<sup>6</sup>Includes data for screenings as follows: Mechanical, 12,759 tons; sulphite, 37,463; sulphate, 1,784.<sup>7</sup>Includes data for screenings as follows: Mechanical, 12,220 tons; chemical, not shown by process, 35,003.<sup>8</sup>Includes data for screenings as follows: Mechanical, 11,769 tons; chemical, not shown by process, 35,824.

Source: U. S. Department of Commerce and Bureau of the Census Bulletin: Forest Products, 1928; Paper and Paper Board, Pulpwood Consumption and Wood Pulp Production. Department of Agriculture, Bulletin No. 1241.

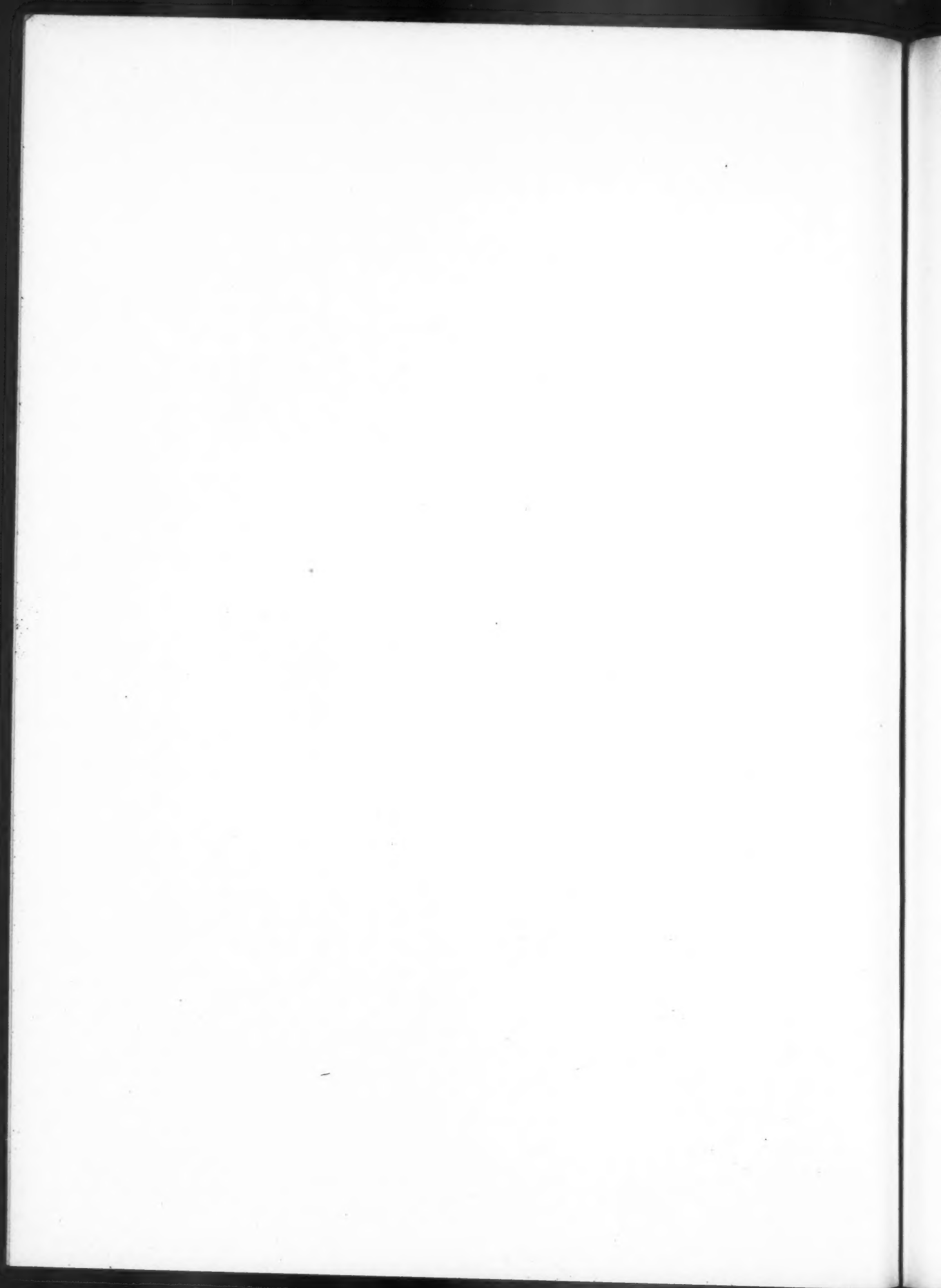
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Supplement to Pacific Pulp & Paper Industry

**LOUIS BLOCH**

Chairman of the Board, Crown Zellerbach Corporation



## PULP IMPORTS—1922-1929

Entering U. S. Pacific Coast Customs Districts

|                            | Los Angeles |         | San Francisco |         | Oregon |         | Washington |         | Total  |         |
|----------------------------|-------------|---------|---------------|---------|--------|---------|------------|---------|--------|---------|
|                            | Tons        | Dollars | Tons          | Dollars | Tons   | Dollars | Tons       | Dollars | Tons   | Dollars |
| <b>MECHANICALLY GROUND</b> |             |         |               |         |        |         |            |         |        |         |
| 1922                       | 620         | 40,884  | —             | —       | —      | —       | 238        | 8,389   | 658    | 49,273  |
| 1923                       | 731         | 33,200  | 727           | 13,157  | —      | —       | 111        | 5,988   | 1,569  | 52,345  |
| 1924                       | 871         | 36,765  | 1,780         | 43,327  | —      | —       | 94         | 4,310   | 2,745  | 84,402  |
| 1925                       | 200         | 6,635   | 1,374         | 40,164  | —      | —       | —          | —       | 1,574  | 46,799  |
| 1926                       | 2,212       | 130,085 | 1,166         | 36,652  | 1,214  | 47,590  | 5,056      | 102,515 | 9,648  | 316,842 |
| 1927                       | 3,442       | 183,323 | 1,582         | 42,476  | —      | —       | —          | —       | 5,024  | 225,799 |
| 1928                       | 2,148       | 65,997  | 3,000         | 86,000  | 248    | 5,211   | 260        | 2,710   | 5,656  | 159,918 |
| 1929                       | 2,221       | 49,016  | 1,503         | 49,931  | 150    | 3,576   | 206        | 6,585   | 4,080  | 109,108 |
| <b>UNBLEACHED SULPHITE</b> |             |         |               |         |        |         |            |         |        |         |
| 1922                       | 1,716       | 95,702  | 1,298         | 54,267  | —      | —       | 3,712      | 171,482 | 6,726  | 321,451 |
| 1923                       | 2,600       | 168,107 | 3,664         | 216,785 | —      | —       | 10,250     | 529,643 | 26,514 | 914,535 |
| 1924                       | 807         | 90,285  | 4,323         | 211,953 | —      | —       | 2,010      | 104,885 | 7,140  | 407,123 |
| 1925                       | 1,805       | 103,040 | 2,031         | 87,384  | 180    | 11,219  | 991        | 59,090  | 5,007  | 260,733 |
| 1926                       | 620         | 36,974  | 5,070         | 265,360 | —      | —       | 3,594      | 207,847 | 9,284  | 510,181 |
| 1927                       | 4,209       | 244,622 | 8,361         | 421,013 | —      | —       | 1,463      | 63,428  | 14,033 | 729,163 |
| 1928                       | 3,343       | 169,484 | 4,420         | 165,439 | —      | —       | 1,153      | 44,561  | 8,916  | 379,484 |
| 1929                       | 8,068       | 401,484 | 8,351         | 346,444 | 582    | 26,879  | 1,362      | 65,579  | 18,363 | 840,386 |
| <b>BLEACHED SULPHITE</b>   |             |         |               |         |        |         |            |         |        |         |
| 1922                       | 98          | 7,348   | 1,616         | 102,774 | —      | —       | 820        | 64,075  | 2,534  | 174,197 |
| 1923                       | 100         | 9,125   | 1,533         | 120,423 | —      | —       | 1,461      | 117,660 | 3,094  | 247,208 |
| 1924                       | 500         | 28,482  | 828           | 49,534  | —      | —       | 784        | 52,228  | 2,112  | 130,244 |
| 1925                       | 995         | 55,094  | 2,053         | 116,678 | 1,500  | 98,913  | 1,270      | 88,380  | 5,818  | 359,065 |
| 1926                       | 3,755       | 233,930 | 3,514         | 180,472 | —      | —       | 2,695      | 163,481 | 9,964  | 577,883 |
| 1927                       | 1,299       | 89,438  | 260           | 9,345   | —      | —       | 2,775      | 189,468 | 4,344  | 288,251 |
| 1928                       | 61          | 4,402   | 530           | 32,251  | —      | —       | 1,564      | 110,644 | 2,155  | 147,297 |
| 1929                       | 1,463       | 77,723  | 556           | 29,039  | 239    | 16,315  | 1,768      | 128,606 | 4,026  | 251,683 |
| <b>UNBLEACHED SULPHATE</b> |             |         |               |         |        |         |            |         |        |         |
| 1922                       | —           | —       | 3,290         | 163,824 | 2,075  | 134,750 | 2,007      | 132,979 | 7,372  | 431,653 |
| 1923                       | 598         | 40,751  | 2,714         | 161,714 | 5,413  | 398,743 | 210        | 9,772   | 8,935  | 610,980 |
| 1924                       | 600         | 34,009  | 2,548         | 148,617 | 7,123  | 452,335 | 34         | 2,207   | 10,305 | 537,168 |
| 1925                       | 3,719       | 217,312 | 2,965         | 147,366 | 9,075  | 554,796 | —          | —       | 15,759 | 919,474 |
| 1926                       | 545         | 34,011  | 4,043         | 224,731 | 3,653  | 225,177 | —          | —       | 8,241  | 483,919 |
| 1927                       | 2,530       | 134,600 | 3,282         | 210,618 | 100    | 4,963   | —          | —       | 5,912  | 350,181 |
| 1928                       | 6,666       | 267,205 | 3,076         | 155,033 | 637    | 22,322  | 54         | 2,420   | 10,433 | 446,980 |
| 1929                       | 4,956       | 212,988 | 1,283         | 39,669  | 500    | 20,625  | 252        | 9,025   | 6,991  | 282,307 |
| <b>BLEACHED SULPHATE</b>   |             |         |               |         |        |         |            |         |        |         |
| 1922                       | —           | —       | 300           | 22,428  | —      | —       | —          | —       | 300    | 22,428  |
| 1923                       | —           | —       | —             | —       | —      | —       | —          | —       | —      | —       |
| 1924                       | —           | —       | 275           | 14,462  | 576    | 25,967  | 45         | 2,945   | 896    | 43,374  |
| 1925                       | 336         | 18,201  | 28            | 824     | —      | —       | —          | —       | 364    | 19,025  |
| 1926                       | 562         | 32,451  | —             | —       | 716    | 44,082  | —          | —       | 1,278  | 76,533  |
| 1927                       | 1,084       | 70,934  | —             | —       | —      | —       | —          | —       | 1,084  | 70,934  |
| 1928                       | —           | —       | —             | —       | —      | —       | —          | —       | —      | —       |
| 1929                       | —           | —       | 746           | 44,392  | —      | —       | —          | —       | 746    | 44,392  |
| <b>OTHER WOOD PULP</b>     |             |         |               |         |        |         |            |         |        |         |
| 1922                       | —           | —       | —             | —       | —      | —       | —          | —       | —      | —       |
| 1923                       | 100         | 9,036   | 276           | 5,745   | —      | —       | —          | —       | 376    | 14,781  |
| 1924                       | —           | —       | —             | —       | —      | —       | —          | —       | —      | —       |
| 1925                       | 25          | 3,657   | —             | —       | —      | —       | 94         | 6,505   | 169    | 10,162  |
| 1926                       | 204         | 5,203   | —             | —       | —      | —       | —          | —       | 204    | 5,203   |
| 1927                       | —           | —       | —             | —       | —      | —       | —          | —       | —      | —       |
| 1928                       | —           | —       | —             | —       | —      | —       | 2          | 78      | 2      | 78      |
| 1929                       | —           | —       | —             | —       | —      | —       | —          | —       | —      | —       |

Figures subject to minor revision.

## PULP EXPORTS—1922-1929

Exported from U. S. Ports on the Pacific Coast

|                        | Los Angeles |         | San Francisco |         | Oregon |         | Washington |         | Total  |         |
|------------------------|-------------|---------|---------------|---------|--------|---------|------------|---------|--------|---------|
|                        | Tons        | Dollars | Tons          | Dollars | Tons   | Dollars | Tons       | Dollars | Tons   | Dollars |
| <b>OTHER WOOD PULP</b> |             |         |               |         |        |         |            |         |        |         |
| 1922                   | —           | —       | —             | —       | —      | —       | 3          | 359     | 3      | 359     |
| 1923                   | —           | —       | —             | —       | 1,000  | 23,000  | 59         | 2,337   | 1,059  | 25,377  |
| 1924                   | —           | —       | 56            | 2,798   | —      | —       | 1          | 45      | 57     | 2,843   |
| 1925                   | —           | —       | 38            | 1,080   | —      | —       | 2          | 123     | 40     | 1,203   |
| 1926                   | 1           | 81      | 19            | 538     | —      | —       | 3          | 150     | 23     | 769     |
| 1927                   | —           | —       | 17            | 554     | —      | —       | 763        | 12,088  | 780    | 12,642  |
| 1928                   | —           | —       | 100           | 7,790   | —      | —       | 1,115      | 41,085  | 1,215  | 48,875  |
| 1929                   | —           | —       | 250           | 22,500  | 21     | 633     | 2,267      | 70,053  | 2,538  | 93,186  |
| <b>SULPHITE</b>        |             |         |               |         |        |         |            |         |        |         |
| 1926                   | —           | —       | —             | —       | 1      | 43      | —          | —       | 1      | 43      |
| 1927                   | —           | —       | —             | —       | 45     | 2,100   | 286        | 17,450  | 331    | 19,550  |
| 1928                   | —           | —       | —             | —       | —      | —       | 672        | 35,663  | 672    | 35,663  |
| 1929                   | —           | —       | —             | —       | 40     | 1,494   | 18,197     | 851,566 | 18,237 | 853,060 |
| <b>SODA</b>            |             |         |               |         |        |         |            |         |        |         |
| 1925                   | —           | —       | 353           | 30,312  | —      | —       | —          | —       | 353    | 30,312  |
| 1927                   | —           | —       | 250           | 20,922  | —      | —       | —          | —       | 250    | 20,922  |
| 1928                   | —           | —       | 98            | 7,760   | —      | —       | —          | —       | 98     | 7,760   |
| 1929                   | —           | —       | 40            | 3,704   | —      | —       | —          | —       | 40     | 3,704   |





## PAPER EXPORTS—1929

From U. S. Pacific Coast Customs Districts

Read "thousand" (i.e., add "000") after all figures denoting pounds. Figure given is nearest thousand  
Subject to minor revision

|                          | Newsprint |         | Printing |         | Writing |         | Greaseproof |         | Wrapping |         | Tissues |         |
|--------------------------|-----------|---------|----------|---------|---------|---------|-------------|---------|----------|---------|---------|---------|
|                          | Pounds    | Dollars | Pounds   | Dollars | Pounds  | Dollars | Pounds      | Dollars | Pounds   | Dollars | Pounds  | Dollars |
| From LOS ANGELES.....    | 32        | 1,633   | 5        | 1,029   | 12      | 3,615   | 1           | 45      | 258      | 19,924  | 101     | 9,583   |
| To Mexico.....           | 4         | 332     | 4        | 1,022   | 10      | 2,695   | 1           | 45      | 92       | 7,502   | 44      | 5,398   |
| To Canada.....           | —         | —       | —        | —       | —       | —       | —           | —       | 10       | 764     | 3       | 346     |
| To Australia.....        | —         | —       | 1        | 7       | —       | —       | —           | —       | 126      | 9,135   | 50      | 3,315   |
| To China.....            | 28        | 1,301   | —        | —       | —       | —       | —           | —       | 4        | 540     | 1       | 18      |
| To Philippines.....      | —         | —       | —        | —       | 1       | 364     | —           | —       | —        | —       | 1       | 200     |
| To Central America.....  | —         | —       | —        | —       | 1       | 556     | —           | —       | 22       | 1,693   | 1       | 188     |
| To All Others.....       | —         | —       | —        | —       | —       | —       | —           | —       | 4        | 290     | 1       | 118     |
| From SAN FRANCISCO.....  | 2,287     | 77,958  | 426      | 31,497  | 1,515   | 85,153  | 70          | 10,453  | 1,810    | 98,691  | 273     | 31,908  |
| To Canada.....           | 14        | 2,447   | 14       | 2,447   | 6       | 1,230   | 4           | 515     | 87       | 4,054   | 2       | 1,702   |
| To Central America.....  | 948       | 32,232  | 205      | 12,785  | 1,180   | 60,745  | 4           | 560     | 413      | 24,173  | 44      | 4,220   |
| To China.....            | 467       | 13,234  | —        | —       | 9       | 2,451   | 32          | 5,106   | 278      | 11,867  | 47      | 5,306   |
| To Philippines.....      | 432       | 15,410  | —        | —       | 12      | 2,494   | 4           | 1,334   | 580      | 24,972  | 97      | 10,024  |
| To Japan.....            | 57        | 1,821   | 29       | 4,821   | 1       | 293     | 1           | 101     | 14       | 1,545   | 2       | 506     |
| To Europe.....           | —         | —       | —        | —       | 1       | 131     | —           | —       | 4        | 277     | 1       | 60      |
| To Mexico.....           | 139       | 5,080   | 51       | 2,814   | 50      | 3,055   | 1           | 180     | 114      | 8,250   | 4       | 679     |
| To South America.....    | 122       | 4,241   | 33       | 2,100   | 169     | 9,760   | 16          | 1,698   | 114      | 7,064   | 12      | 1,142   |
| To Australia.....        | 68        | 4,123   | 6        | 472     | 39      | 1,892   | 6           | 560     | 170      | 13,864  | 39      | 4,442   |
| To All Others.....       | 54        | 1,817   | 88       | 6,058   | 48      | 3,102   | 2           | 399     | 36       | 2,625   | 25      | 3,827   |
| From OREGON.....         | 11,703    | 412,917 | 102      | 14,382  | 5,275   | 273,272 | 83          | 7,914   | 3,169    | 153,243 | 7       | 173     |
| To Philippines.....      | 7,370     | 256,637 | 20       | 1,833   | 2,266   | 122,475 | 82          | 7,539   | 2,316    | 115,795 | 1       | 20      |
| To Australia.....        | 327       | 17,202  | 73       | 11,894  | 1,860   | 91,779  | —           | —       | —        | 1       | 35      | 6       |
| To China.....            | 3,827     | 133,366 | 1        | 48      | 505     | 26,403  | 1           | 375     | 743      | 30,723  | —       | —       |
| To Japan.....            | 56        | 1,791   | —        | —       | 314     | 14,943  | —           | —       | 49       | 2,822   | —       | —       |
| To All Others.....       | 123       | 3,921   | 8        | 607     | 330     | 17,672  | —           | —       | 60       | 3,868   | —       | —       |
| From WASHINGTON.....     | 7,729     | 236,921 | 8,722    | 570,187 | 209     | 22,650  | 53          | 12,115  | 458      | 20,654  | 460     | 36,644  |
| To Canada.....           | 79        | 2,518   | 714      | 96,572  | 89      | 11,682  | 33          | 6,704   | 265      | 13,917  | 323     | 25,461  |
| To Philippines.....      | 1,179     | 40,100  | 1,878    | 102,410 | 48      | 4,375   | 7           | 3,599   | 148      | 4,195   | 91      | 7,518   |
| To China.....            | 1         | 178     | 5,854    | 354,211 | 2       | 483     | 12          | 1,804   | 1        | 157     | 5       | 406     |
| To Japan.....            | —         | —       | 5        | 1,183   | 3       | 2,220   | 1           | 8       | 2        | 551     | 15      | 1,192   |
| To Australia.....        | —         | —       | 266      | 15,130  | 66      | 3,684   | —           | —       | —        | —       | 4       | 245     |
| To All Others.....       | 6,470     | 194,125 | 5        | 681     | 1       | 206     | —           | —       | 42       | 1,834   | 22      | 1,822   |
| Pacific Coast Total..... | 21,751    | 729,429 | 9,255    | 617,095 | 7,011   | 384,690 | 207         | 30,527  | 5,695    | 292,512 | 841     | 78,308  |

|                          | Board  |         | Building |         | Boxes & Cartons |         | Paper Bags |         | Converted Paper Products |         | Miscellaneous Paper & Prod. |         |
|--------------------------|--------|---------|----------|---------|-----------------|---------|------------|---------|--------------------------|---------|-----------------------------|---------|
|                          | Pounds | Dollars | Pounds   | Dollars | Pounds          | Dollars | Pounds     | Dollars | Pounds                   | Dollars | Pounds                      | Dollars |
| From LOS ANGELES.....    | 12     | 1,105   | 1,444    | 42,409  | 11              | 786     | 105        | 8,133   | 11                       | 4,732   | 27,685                      | —       |
| To Mexico.....           | 7      | 552     | 123      | 6,134   | 5               | 468     | 9          | 765     | 8                        | 3,664   | 15,038                      | —       |
| To Canada.....           | 2      | 79      | —        | —       | —               | —       | —          | —       | 1                        | 553     | 930                         | —       |
| To Australia.....        | —      | —       | 795      | 21,496  | 1               | 48      | —          | —       | —                        | —       | 6,037                       | —       |
| To China.....            | 2      | 399     | 222      | 4,891   | 2               | 124     | —          | —       | —                        | —       | 3,317                       | —       |
| To Philippines.....      | 1      | 75      | 3        | 233     | 2               | 129     | 60         | 5,200   | 1                        | 325     | 1,090                       | —       |
| To Central America.....  | —      | —       | 1        | 88      | —               | —       | 36         | 2,167   | —                        | —       | 862                         | —       |
| To All Others.....       | —      | —       | 300      | 9,567   | 1               | 17      | —          | —       | 1                        | 190     | 811                         | —       |
| From SAN FRANCISCO.....  | 16,658 | 622,618 | 4,160    | 149,678 | 508             | 38,680  | 1,003      | 78,609  | 132                      | 46,943  | 236,377                     | —       |
| To Canada.....           | 81     | 8,576   | 14       | 1,174   | 20              | 2,580   | 7          | 1,762   | 8                        | 2,514   | 17,284                      | —       |
| To Central America.....  | 357    | 15,136  | 1        | 95      | 9               | 1,433   | 388        | 23,375  | 11                       | 5,152   | 5,405                       | —       |
| To China.....            | 10,320 | 423,062 | 459      | 13,320  | 68              | 5,530   | 7          | 1,069   | 11                       | 2,960   | 12,024                      | —       |
| To Philippines.....      | 149    | 5,680   | 176      | 7,227   | 169             | 13,098  | 185        | 11,976  | 25                       | 9,028   | 21,571                      | —       |
| To Japan.....            | 1,346  | 30,023  | 902      | 32,482  | 10              | 1,467   | 3          | 591     | 20                       | 2,652   | 15,044                      | —       |
| To Europe.....           | 73     | 2,225   | 16       | 788     | 2               | 191     | 1          | 71      | 1                        | 14      | 1,716                       | —       |
| To Mexico.....           | 6      | 961     | 18       | 1,078   | 19              | 1,824   | 57         | 5,771   | 1                        | 376     | 13,171                      | —       |
| To South America.....    | 15     | 2,783   | 316      | 10,704  | 67              | 3,342   | 278        | 26,692  | 41                       | 19,507  | 4,013                       | —       |
| To Australia.....        | 2,487  | 80,561  | 1,204    | 43,005  | 27              | 2,414   | 17         | 1,165   | 10                       | 2,571   | 144,123                     | —       |
| To All Others.....       | 1,824  | 53,611  | 1,054    | 39,805  | 117             | 6,801   | 60         | 6,137   | 4                        | 2,169   | 4,026                       | —       |
| From OREGON.....         | 7,209  | 159,465 | —        | —       | 1,493           | 265,627 | 1,708      | 100,504 | 13                       | 1,573   | 7,129                       | —       |
| To Philippines.....      | 31     | 741     | —        | —       | —               | —       | 1,073      | 62,319  | 12                       | 1,516   | 179                         | —       |
| To Australia.....        | 503    | 16,623  | —        | —       | 236             | 7,818   | —          | —       | —                        | —       | 6,855                       | —       |
| To China.....            | 6,675  | 142,101 | —        | —       | 1,256           | 257,773 | 11         | 589     | 1                        | 57      | —                           | —       |
| To Japan.....            | —      | —       | —        | —       | 1               | 36      | 624        | 37,596  | —                        | —       | 6                           | —       |
| To All Others.....       | —      | —       | —        | —       | —               | —       | —          | —       | —                        | —       | 89                          | —       |
| From WASHINGTON.....     | 2,587  | 106,036 | 2        | 80      | 128             | 9,815   | 97         | 8,808   | 256                      | 29,871  | 87,252                      | —       |
| To Canada.....           | 1,997  | 80,575  | 2        | 80      | 86              | 6,826   | 10         | 1,795   | 39                       | 9,188   | 53,255                      | —       |
| To Philippines.....      | 252    | 12,842  | —        | —       | 7               | 391     | 86         | 6,917   | 5                        | 1,358   | 12,029                      | —       |
| To China.....            | 38     | 1,540   | —        | —       | 28              | 948     | 1          | 96      | 36                       | 2,217   | 6,106                       | —       |
| To Japan.....            | 21     | 2,059   | —        | —       | —               | —       | —          | —       | 174                      | 16,925  | 6,926                       | —       |
| To Australia.....        | 189    | 6,186   | —        | —       | —               | —       | —          | —       | 1                        | 83      | 7,635                       | —       |
| To All Others.....       | 90     | 2,834   | —        | —       | 1               | 192     | —          | —       | 1                        | 100     | 1,301                       | —       |
| Pacific Coast Total..... | 26,466 | 889,224 | 5,606    | 192,167 | 2,141           | 314,909 | 2,913      | 196,053 | 412                      | 83,119  | 358,443                     | —       |

Total Exports of Paper and Paper Products from Pacific Coast Ports during 1929, \$4,166,476.

Total Exports of Paper and Paper Products from Los Angeles, \$120,678; from San Francisco, \$1,508,565; from Oregon, \$1,396,199; from Washington, \$1,141,034.

CLASSIFICATIONS—For convenience of presentation, some classifications have been combined, as follows: "printing" includes book (not coated), cover and surface coated paper; "greaseproof" includes water-proof; "tissues" includes crepe, tissue, paper towels, napkins and toilet; "board" includes boxboard, bristol, bristolboard and other paper board and strawboard; "building" includes sheathing, and other building paper; "writing" includes fancy papereries and other writing; "converted paper products" includes envelopes, cash register rolls, index file and other office

forms; "miscellaneous" includes blotters, paper hangings, vulcanized fibre sheets, strips, rods and tubes, manufactures of vulcanized fibre and other paper products. COUNTRIES—Under the classification "Central America" are included all of the Central American countries and Cuba. "South America" includes only the following South American countries: Ecuador, Paraguay, Bolivia, Uruguay, and the Guianas; other South American countries are classified separately. "Orient" includes all the Asiatic countries with the exception of China and Japan, which are separately classified. New Zealand is included under "Australia".

## PAPER EXPORTS—1922-1929

From U. S. Pacific Coast Customs Districts

|   | LOS ANGELES |         | SAN FRANCISCO |         | OREGON     |         | WASHINGTON |         | TOTAL      |         |
|---|-------------|---------|---------------|---------|------------|---------|------------|---------|------------|---------|
|   | Pounds      | Dollars | Pounds        | Dollars | Pounds     | Dollars | Pounds     | Dollars | Pounds     | Dollars |
| <b>NEWSPRINT</b>                          |             |         |               |         |            |         |            |         |            |         |
| 1922                                      |             |         | 1,245,000     | 64,000  | 5,282,000  | 243,000 | 579,000    | 29,000  | 7,106,000  | 336,000 |
| 1923                                      | 10,000      | 600     | 326,000       | 30,000  | 2,833,000  | 129,000 | 1,072,000  | 38,000  | 4,441,000  | 217,600 |
| 1924                                      | 17,000      | 1,000   | 607,000       | 46,000  | 2,487,000  | 108,000 | 1,731,000  | 96,000  | 4,842,000  | 251,000 |
| 1925                                      | 18,000      | 1,000   | 460,000       | 23,000  | 11,914,000 | 503,000 | 1,065,000  | 54,000  | 13,437,000 | 581,000 |
| 1926                                      | 14,000      | 1,000   | 3,209,000     | 137,000 | 12,756,000 | 583,000 | 406,000    | 22,000  | 16,385,000 | 743,000 |
| 1927                                      | 26,000      | 1,000   | 614,000       | 33,000  | 6,962,000  | 286,000 | 604,000    | 35,000  | 8,106,000  | 355,000 |
| 1928                                      | 2,000       | 790     | 2,344,000     | 88,000  | 7,547,000  | 301,000 | 426,000    | 18,000  | 10,319,000 | 407,790 |
| 1929                                      | 32,000      | 1,633   | 2,287,000     | 78,000  | 11,708,000 | 413,000 | 7,729,000  | 237,000 | 21,751,000 | 729,429 |
| <b>PRINTING†</b>                          |             |         |               |         |            |         |            |         |            |         |
| 1922                                      | 400         | 50      | 36,000        | 5,900   | 2,000      | 200     | 2,388,000  | 182,000 | 2,426,400  | 188,150 |
| 1923                                      | 800         | 130     | 156,000       | 16,000  | 3,000      | 400     | 1,519,000  | 126,000 | 1,678,800  | 142,430 |
| 1924                                      | 1,600       | 150     | 553,000       | 47,000  | 600        | 100     | 555,000    | 48,000  | 1,110,200  | 95,250  |
| 1925                                      | 7,000       | 900     | 194,000       | 19,000  | 700        | 400     | 615,000    | 52,000  | 816,700    | 255,000 |
| 1926                                      | 4,000       | 1,000   | 625,000       | 47,000  | 114,000    | 7,000   | 611,000    | 51,000  | 1,314,000  | 106,000 |
| 1927                                      | 4,000       | 600     | 567,000       | 45,000  | 1,133,000  | 57,000  | 1,117,000  | 25,000  | 2,821,000  | 127,600 |
| 1928                                      | 4,000       | 824     | 768,000       | 48,000  | 585,000    | 31,000  | 3,404,000  | 228,000 | 4,761,000  | 307,000 |
| 1929                                      | 5,000       | 1,000   | 426,000       | 31,000  | 102,000    | 14,000  | 8,722,000  | 570,000 | 9,255,000  | 617,000 |
| <b>WRITING‡</b>                           |             |         |               |         |            |         |            |         |            |         |
| 1922                                      | 5,000       | 800     | 289,000       | 50,000  |            |         | 857,000    | 85,000  | 1,151,000  | 135,800 |
| 1923                                      | 7,000       | 3,000   | 229,000       | 37,000  | 32,000     | 3,000   | 641,000    | 67,000  | 909,000    | 110,000 |
| 1924                                      | 13,000      | 4,000   | 125,000       | 21,000  | 2,000      | 1,000   | 706,000    | 64,000  | 846,000    | 90,000  |
| 1925                                      | 25,000      | 10,000  | 32,000        | 8,000   |            |         | 216,000    | 21,000  | 273,000    | 39,000  |
| 1926                                      | 13,000      | 5,000   | 33,000        | 12,000  | 108,000    | 6,000   | 353,000    | 49,000  | 507,000    | 72,000  |
| 1927                                      | 12,000      | 3,000   | 112,000       | 20,000  | 13,000     | 1,000   | 116,000    | 18,000  | 253,000    | 42,000  |
| 1928                                      | 5,000       | 2,000   | 1,311,000     | 76,000  | 2,803,000  | 135,000 | 272,000    | 23,000  | 4,391,000  | 236,000 |
| 1929                                      | 12,000      | 4,000   | 1,515,000     | 85,153  | 5,275,000  | 273,000 | 209,000    | 23,000  | 7,011,000  | 384,690 |
| <b>GREASEPROOF</b>                        |             |         |               |         |            |         |            |         |            |         |
| 1922                                      | 600         | 50      | 7,000         | 1,000   | 2,000      | 300     | 7,000      | 600     | 16,600     | 1,950   |
| 1923                                      |             |         | 72,000        | 8,000   |            |         | 16,000     | 2,000   | 88,000     | 10,000  |
| 1924                                      |             |         | 74,000        | 5,000   | 8,000      | 1,000   | 4,000      | 600     | 86,000     | 6,600   |
| 1925                                      | 2,000       | 200     | 91,000        | 12,000  | 20,000     | 2,000   | 54,000     | 7,000   | 167,000    | 21,200  |
| 1926                                      | 800         | 70      | 71,000        | 8,000   | 41,000     | 4,000   | 28,000     | 4,000   | 140,800    | 15,070  |
| 1927                                      | 450         | 80      | 256,000       | 29,000  | 101,000    | 10,000  | 17,000     | 4,000   | 374,450    | 43,080  |
| 1928                                      | 341         | 13      | 245,000       | 16,000  | 136,000    | 13,000  | 59,000     | 7,000   | 440,341    | 36,013  |
| 1929                                      | 1,000       | 45      | 70,000        | 10,000  | 83,000     | 8,000   | 53,000     | 12,000  | 207,000    | 30,000  |
| <b>KRAFT WRAPPING¶</b>                    |             |         |               |         |            |         |            |         |            |         |
| 1922                                      |             |         | 17,000        | 2,000   |            |         | 42,000     | 3,000   | 59,000     | 5,000   |
| 1923                                      | 8,000       | 800     | 34,000        | 4,000   |            |         |            |         | 42,000     | 4,800   |
| 1924                                      | 2,000       | 200     | 15,000        | 1,000   |            |         | 500        | 60      | 17,500     | 1,260   |
| 1925                                      | 7,000       | 500     | 10,000        | 1,000   | 125,000    | 8,000   | 6,000      | 2,000   | 148,000    | 11,500  |
| <b>WRAPPING¶</b>                          |             |         |               |         |            |         |            |         |            |         |
| 1922                                      | 12,000      | 2,000   | 877,000       | 66,000  | 139,000    | 8,000   | 372,000    | 20,000  | 1,400,000  | 96,000  |
| 1923                                      | 47,000      | 5,000   | 560,000       | 41,000  | 275,000    | 15,000  | 557,000    | 27,000  | 1,439,000  | 88,000  |
| 1924                                      | 31,000      | 2,000   | 433,000       | 32,000  | 146,000    | 9,000   | 669,000    | 36,000  | 1,279,000  | 79,000  |
| 1925                                      | 49,000      | 4,000   | 627,000       | 41,000  | 1,085,000  | 58,000  | 355,000    | 26,000  | 2,116,000  | 129,000 |
| 1926                                      | 82,000      | 5,000   | 1,387,000     | 78,000  | 1,986,000  | 109,000 | 106,000    | 7,000   | 3,561,000  | 199,000 |
| 1927                                      | 280,000     | 21,000  | 1,157,000     | 65,000  | 1,659,000  | 83,000  | 122,000    | 11,000  | 3,218,000  | 180,000 |
| 1928                                      | 366,000     | 27,000  | 1,585,000     | 96,000  | 3,883,000  | 171,000 | 861,000    | 50,000  | 6,695,000  | 344,000 |
| 1929                                      | 258,000     | 19,000  | 1,810,000     | 98,000  | 3,169,000  | 153,000 | 458,000    | 21,000  | 5,695,000  | 292,000 |
| <b>TISSUES§</b>                           |             |         |               |         |            |         |            |         |            |         |
| 1922                                      | 6,000       | 900     | 201,000       | 30,000  |            |         | 196,000    | 30,000  | 403,000    | 60,900  |
| 1923                                      | 18,000      | 2,000   | 198,000       | 27,000  | 800        | 400     | 114,000    | 15,000  | 330,800    | 44,400  |
| 1924                                      | 29,000      | 4,000   | 327,000       | 37,000  | 34,000     | 4,000   | 248,000    | 32,000  | 638,000    | 77,000  |
| 1925                                      | 32,000      | 4,000   | 265,000       | 36,000  |            |         | 254,000    | 30,000  | 551,000    | 70,000  |
| 1926                                      | 27,000      | 3,000   | 309,000       | 44,000  |            |         | 157,000    | 27,000  | 493,000    | 74,000  |
| 1927                                      | 38,000      | 4,000   | 340,000       | 58,000  | 50         | 10      | 147,000    | 22,000  | 525,950    | 84,010  |
| 1928                                      | 142,000     | 12,000  | 377,000       | 47,000  | 37,000     | 4,000   | 237,000    | 20,000  | 793,000    | 83,000  |
| 1929                                      | 101,000     | 9,000   | 273,000       | 32,000  | 7,000      | 173     | 460,000    | 37,000  | 841,000    | 78,000  |
| <b>BOXBOARD§§</b>                         |             |         |               |         |            |         |            |         |            |         |
| 1922                                      |             |         |               |         |            |         |            |         |            |         |
| 1923                                      |             |         |               |         |            |         |            |         |            |         |
| 1924                                      |             |         |               |         |            |         |            |         |            |         |
| 1925                                      | 1,328,000   | 35,000  | 4,454,000     | 206,000 |            |         | 1,129,000  | 43,000  | 6,911,000  | 284,000 |
| 1926                                      | 2,855,000   | 66,000  | 11,744,000    | 325,000 |            |         | 1,971,000  | 70,000  | 16,570,000 | 461,000 |
| 1927                                      | 763,000     | 18,000  | 10,166,000    | 312,000 | 25,000     | 700     | 3,461,000  | 108,000 | 14,415,000 | 438,700 |
| 1928                                      | 649,000     | 22,000  | 11,106,000    | 383,000 | 4,957,000  | 110,000 | 3,286,000  | 105,000 | 19,998,000 | 630,000 |
| 1929                                      | 12,000      | 1,000   | 16,658,000    | 622,618 | 7,209,000  | 159,000 | 2,587,000  | 106,000 | 26,466,000 | 889,000 |
| <b>OTHER PAPER BOARD AND STRAWBOARD§§</b> |             |         |               |         |            |         |            |         |            |         |
| 1922                                      | 99,000      | 5,000   | 11,891,000    | 524,000 |            |         | 2,270,000  | 88,000  | 14,260,000 | 617,000 |
| 1923                                      | 5,000       | 500     | 12,885,000    | 503,000 |            |         | 2,578,000  | 118,000 | 15,468,000 | 621,500 |
| 1924                                      | 2,351,000   | 70,000  | 15,663,000    | 509,000 | 47,000     | 2,000   | 1,115,000  | 46,000  | 19,176,000 | 627,000 |
| 1925                                      | 28,000      | 1,000   | 916,000       | 58,000  |            |         | 262,000    | 17,000  | 1,206,000  | 76,000  |
| 1926                                      | 9,000       | 500     | 214,000       | 35,000  | 100        | 10      | 365,000    | 15,000  | 588,100    | 50,510  |
| 1927                                      | 7,000       | 300     | 440,000       | 34,000  | 14,000     | 500     | 1,050,000  | 32,000  | 1,511,000  | 66,800  |
| 1928                                      | 3,000       | 300     | 495,000       | 30,000  | 67,000     | 3,000   | 366,000    | 18,000  | 931,000    | 51,300  |
| <b>PAPER BAGS</b>                         |             |         |               |         |            |         |            |         |            |         |
| 1922                                      |             |         | 277,000       | 29,000  | 35,000     | 4,000   | 72,000     | 7,000   | 384,000    | 40,000  |
| 1923                                      | 12,000      | 2,000   | 222,000       | 27,000  | 300        | 50      | 133,000    | 12,000  | 367,300    | 41,050  |
| 1924                                      | 21,000      | 2,000   | 451,000       | 36,000  |            |         | 31,000     | 3,000   | 503,000    | 41,000  |
| 1925                                      | 30,000      | 3,000   | 510,000       | 32,000  | 47,000     | 3,000   | 74,000     | 5,000   | 661,000    | 43,000  |
| 1926                                      | 32,000      | 3,000   | 755,000       | 55,000  | 10,000     | 800     | 51,000     | 4,000   | 848,000    | 62,800  |
| 1927                                      | 34,000      | 3,000   | 459,000       | 37,000  | 334,000    | 21,000  | 23,000     | 2,000   | 850,000    | 63,000  |
| 1928                                      | 18,000      | 1,000   | 538,000       | 49,000  | 455,000    | 24,000  | 15,000     | 1,000   | 1,026,000  | 75,000  |
| 1929                                      | 105,000     | 8,132   | 1,003,000     | 78,000  | 1,708,000  | 100,000 | 97,000     | 8,000   | 2,916,000  | 196,000 |
| <b>BOXES AND CARTONS</b>                  |             |         |               |         |            |         |            |         |            |         |
| 1922                                      | 2,000       | 200     | 150,000       | 18,000  |            |         | 69,000     | 8,000   | 221,000    | 26,200  |
| 1923                                      | 1,000       | 300     | 89,000        | 14,000  | 500        | 300     | 12,000     | 11,000  | 102,500    | 25,600  |
| 1924                                      | 2,000       | 500     | 286,000       | 77,000  |            |         | 96,000     | 13,000  | 384,000    | 80,500  |
| 1925                                      | 2,000       | 300     | 197,000       | 21,000  |            |         | 48,000     | 7,000   | 247,000    | 28,300  |
| 1926                                      | 8,000       | 1,000   | 275,000       | 32,000  | 1,000      | 100     | 269,000    | 21,000  | 553,000    | 54,100  |
| 1927                                      | 8,000       | 1,000   | 186,000       | 20,000  | 5,000      | 1,000   | 77,000     | 8,000   | 276,000    | 30,000  |
| 1928                                      | 12,000      | 1,000   | 490,000       | 45,000  | 8,000      | 1,000   | 125,000    | 7,000   | 635,000    | 54,000  |
| 1929                                      | 11,000      | 786     | 508,000       | 39,000  | 1,443,000  | 265,000 | 128,000    | 10,000  | 2,141,000  | 315,000 |

Figures in this table have been simplified by reduction to the nearest thousand, except in the case of small items of less than 1,000 pounds or less than \$1,000.

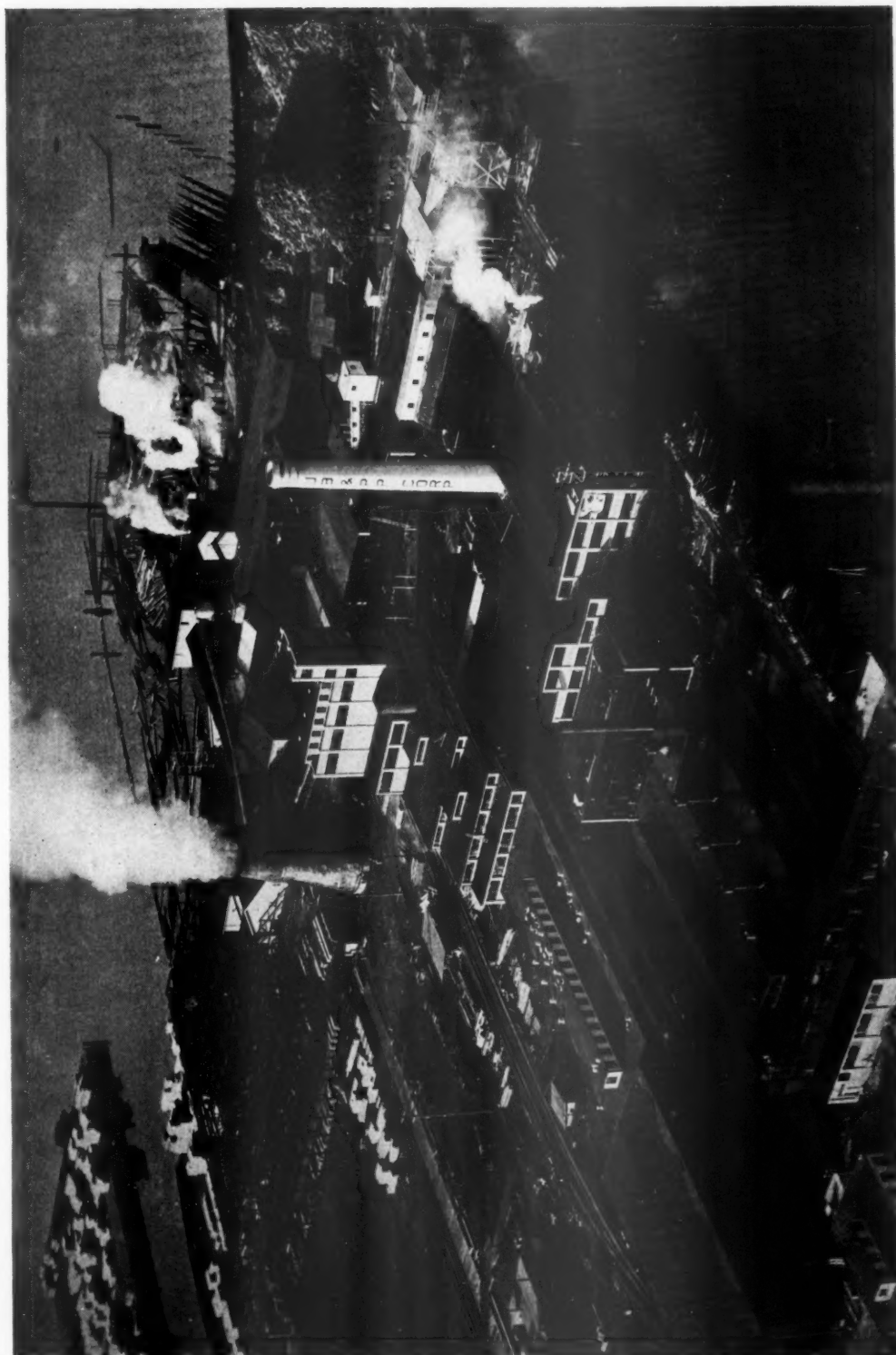
†"Printing" also includes book (coated and not coated) and cover paper.

‡"Writing" includes papeteries and other writing.

§"Tissues" include tissues, crepe, toilet, napkins, towels, etc.

§§"Boxboard" includes bristols, sheathing and building paper. All paper and straw board are included in 1929 figures.

¶Kraft wrapping for 1926, 1927 and 1928 are included in "wrapping".



Brubaker Aerial Surveys, Portland

**TACOMA, WASHINGTON**

The Union Bag & Paper Power Corporation completed this new 120-ton sulphate pulp mill last year to supplant a dwindling pulp supply in the East. The St. Paul & Tacoma Lumber Company built a Western Hemlock sawmill adjoining, and all of its waste is diverted directly to the pulp mill on time contract.



## PACIFIC PULP &amp; PAPER INDUSTRY

## PAPER PRODUCTION IN CANADA—1928

By Grades—In Tons of 2,000 Lbs.

| Grade—                                 | Tons      | Value                |
|--|-----------|----------------------|
| Newsprint .....                        | 2,414,393 | \$144,146,632        |
| Book and Writing .....                 | 79,138    | 14,008,406           |
| Wrapping Paper .....                   | 111,667   | 10,424,217           |
| Paper Boards .....                     | 193,061   | 10,656,200           |
| Other Paper Products .....             | 50,940    | 5,069,950            |
| Total Specified Paper .....            | 2,849,199 | \$184,305,405        |
| Unspecified and other products .....   |           | 156,951              |
| <b>Grand Total, All Products .....</b> |           | <b>\$184,462,356</b> |
| <b>Total for 1927 .....</b>            |           | <b>168,445,548</b>   |
| <b>Total for 1926 .....</b>            |           | <b>158,277,078</b>   |

Source: Canadian Department of Trade and Commerce, Dominion Bureau of Statistics, Forest Products Branch.

## WOOD USED IN THE MANUFACTURE OF PULP

British Columbia—By Kinds and Processes—1928

| Kind of Wood             | Quantity<br>Cords | Value<br>Dollars  | Quantity of Wood Used in<br>Each Process |                   |                        |
|--------------------------|-------------------|-------------------|--|-------------------|------------------------|
|                          |                   |                   | Mechanical<br>Cords                      | Sulphite<br>Cords | Kraft or<br>Soda Cords |
| <b>Total .....</b>       | <b>383,008*</b>   | <b>3,907,755*</b> | <b>149,976</b>                           | <b>209,448</b>    | <b>23,584</b>          |
| Spruce .....             | 94,525            | 1,120,074         | 88,721                                   | 5,228             | 576                    |
| Balsam Fir .....         | 69,170            | 702,039           | 31,031                                   | 38,082            | 57                     |
| Western<br>Hemlock ..... | 188,999           | 1,770,102         | 28,725                                   | 154,559           | 5,715                  |
| Poplar .....             | 97                | 758               | 97                                       |                   |                        |
| All Others .....         | 30,217            | 314,782           | 1,402                                    | 11,579            | 17,236                 |

\*In addition, 21,222 cords of pulpwood, valued at \$160,942, were exported, making the apparent total pulpwood production in British Columbia equivalent to 404,230 cords, valued at \$4,068,697.

Source: Canadian Department of Trade and Commerce, Dominion Bureau of Statistics, Forest Products Branch.

WOOD PULP AND OTHER PAPER STOCK USED IN  
MANUFACTURE OF PAPER IN BRITISH COLUMBIA  
1928

|   | Tons of<br>2,000 Lbs. | Value              |
|---|-----------------------|--------------------|
| Wood Pulp Made in Own Establishment ..... | 245,302               | \$4,771,125        |
| Wood Pulp Purchased .....                 | 7,007                 | 289,050            |
| <b>Total Wood Pulp Used .....</b>         | <b>252,309</b>        | <b>5,060,175</b>   |
| Other Fibre and Stock Purchased .....     | 3,117                 | 45,171             |
| <b>Total Paper Stock Used .....</b>       | <b>255,426</b>        | <b>\$5,105,340</b> |

Source: Canadian Department of Trade and Commerce, Dominion Bureau of Statistics, Forest Products Branch.

## BRITISH COLUMBIA—1928

## Principal Statistics of the Pulp and Paper Industry

|                                   |              |
|-----------------------------------|--------------|
| Capital invested .....            | \$47,331,108 |
| Total number of employes .....    | 2,855        |
| Salaries and wages .....          | 4,432,572    |
| Fuel and electricity used .....   | 1,125,444    |
| Power Employed (Total H.P.) ..... | 98,095       |
| Pulp-making materials .....       | 4,783,124    |
| Pulp manufactured .....           | 8,232,663    |
| Paper-making materials .....      | 5,345,003    |
| Paper manufactured .....          | 14,940,462   |
| Total Gross Production .....      | 18,714,056   |
| Total net production .....        | 13,357,054   |

Source: Canadian Department of Trade and Commerce, Dominion Bureau of Statistics, Forest Products Branch.

## REVIEW OF THE PULP AND PAPER INDUSTRY

in British Columbia—1919-1929

Official pulp and paper production figures for British Columbia show consistent increases for 1928 in all grades of pulp and paper.

The following table gives the official production figures since 1919:

|            | —PULP—   |          |          | —PAPER—    |        |
|------------|----------|----------|----------|------------|--------|
|            | Sulphite | Sulphate | Groundwd | News Print | Other  |
| 1929 ..... | 112,925  | 15,647   | 151,066  | 201,009    | 19,492 |
| 1928 ..... | 120,413  | 15,050   | 170,005  | 225,477    | 15,960 |
| 1927 ..... | 119,005  | 13,700   | 163,548  | 214,010    | 13,745 |
| 1926 ..... | 108,381  | 15,000   | 136,123  | 176,924    | 10,389 |
| 1925 ..... | 92,514   | 16,856   | 121,363  | 148,201    | 9,261  |
| 1924 ..... | 89,839   | 14,403   | 112,001  | 136,281    | 9,653  |
| 1923 ..... | 99,878   | 9,932    | 107,266  | 142,928    | 7,709  |
| 1922 ..... | 86,894   | 9,674    | 100,759  | 124,639    | 7,945  |
| 1921 ..... | 68,502   | 6,519    | 89,725   | 110,176    | 6,934  |
| 1920 ..... | 92,299   | 16,380   | 108,655  | 136,832    | 9,792  |
| 1919 ..... | 80,347   | 9,473    | 99,769   | 123,607    | 7,202  |

## Total Production All Grades—Tons

|            | Pulp    |         | Paper | Estimated value<br>of production: |
|------------|---------|---------|-------|-----------------------------------|
|            | Pulp    | Paper   |       |                                   |
| 1929 ..... | 279,638 | 220,501 |       | \$14,400,000                      |
| 1928 ..... | 305,468 | 241,437 |       | 16,755,000                        |
| 1927 ..... | 296,253 | 227,755 |       | 18,505,000                        |
| 1926 ..... | 259,504 | 187,313 |       | 16,315,000                        |
| 1925 ..... | 230,733 | 157,462 |       | 14,466,000                        |
| 1924 ..... | 216,243 | 145,934 |       | 13,938,000                        |
| 1923 ..... | 217,076 | 150,637 |       | 15,018,000                        |
| 1922 ..... | 197,327 | 132,584 |       | 12,590,000                        |
| 1921 ..... | 164,746 | 117,110 |       | 13,500,000                        |
| 1920 ..... | 217,334 | 146,624 |       |                                   |
| 1919 ..... | 189,589 | 130,809 |       |                                   |

## Value of Canadian Pulpwood Production

| Year               | Pulpwood<br>Used     | Pulpwood<br>Exported | Total<br>Production  |
|--------------------|----------------------|----------------------|----------------------|
| 1921 .....         | \$ 38,283,262        | \$14,617,610         | \$ 52,900,872        |
| 1922 .....         | 40,375,599           | 10,359,762           | 50,735,361           |
| 1923 .....         | 43,594,592           | 13,525,004           | 57,119,596           |
| 1924 .....         | 44,241,582           | 13,536,058           | 57,777,640           |
| 1925 .....         | 48,012,602           | 14,168,935           | 62,181,537           |
| 1926 .....         | 54,033,273           | 14,067,030           | 68,100,303           |
| 1927 .....         | 54,582,190           | 15,702,705           | 70,284,895           |
| 1928 .....         | 59,578,417           | 15,269,660           | 74,848,077           |
| <b>Total .....</b> | <b>\$382,701,517</b> | <b>\$111,246,764</b> | <b>\$493,948,281</b> |

Source: Canadian Department of Trade and Commerce, Dominion Bureau of Statistics, Forest Products Branch.

## PULP AND PAPER EXPORTS

British Columbia

Loaded at Ocean Falls, Powell River, Swanson Bay, Port Alice, Woodfibre and Vancouver

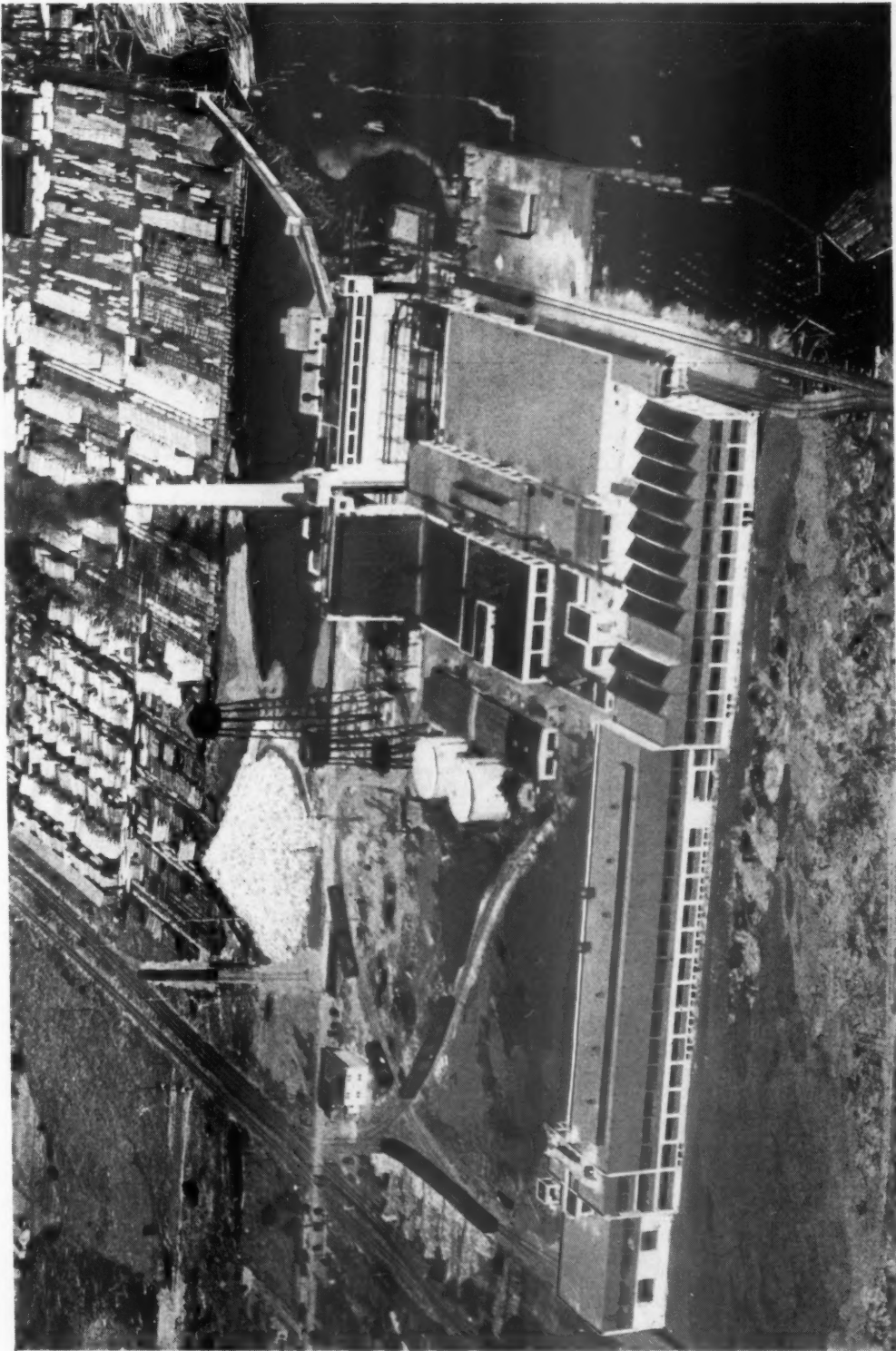
(Compiled by Vancouver Merchants' Exchange)

| Destination                   | 1925           | 1926           | 1927           | 1928           | 1929           |
|-------------------------------|----------------|----------------|----------------|----------------|----------------|
| Australia .....               | 2,115          | 13,950         | 18,226         | 14,550         | 21,480         |
| Argentina .....               |                |                |                | 34,045         |                |
| Central & South America ..... | 11,000         |                |                | 1,667          | 14,677         |
| Canada (Eastern ports) .....  |                | 41,823         |                |                | 2,130          |
| China .....                   |                |                | 80             | 35             | 1,870          |
| Japan .....                   | 25,884         |                | 53,244         | 57,230         | 45,526         |
| New Zealand .....             | 11,890         | 10,560         | 8,702          | 20,548         | 9,525          |
| United Kingdom .....          |                |                |                |                | 1,728          |
| United States .....           | 175,233        | 158,917        | 152,002        | 172,017        | 156,788        |
| Other Countries .....         |                |                | 1,980          | 1,119          | 277            |
| <b>Total Short Tons .....</b> | <b>208,122</b> | <b>235,506</b> | <b>243,671</b> | <b>301,211</b> | <b>254,001</b> |

## PULP WOOD IMPORTED INTO WASHINGTON\*—1921-1929

|            | Rough  |         | Peeled |         | Rosed |         |
|------------|--------|---------|--------|---------|-------|---------|
|            | Cords  | Dollars | Cords  | Dollars | Cords | Dollars |
| 1921 ..... | 11,923 | 74,339  | 512    | 2,454   |       |         |
| 1922 ..... | 6,238  | 37,388  | 1,395  | 8,857   | 43    | 189     |
| 1923 ..... | 15,996 | 89,590  | 3,968  | 26,963  | 108   | 561     |
| 1924 ..... | 9,298  | 83,739  | 18,257 | 179,347 | 209   | 3,111   |
| 1925 ..... | 6,496  | 61,390  | 17,064 | 140,043 | 284   | 2,937   |
| 1926 ..... | 2,826  | 26,510  | 13,438 | 89,310  | 125   | 1,375   |
| 1927 ..... | 3,527  | 27,530  | 9,235  | 53,896  |       |         |
| 1928 ..... | 8,132  | 56,765  | 3,625  | 24,254  |       |         |
| 1929 ..... | 2,703  | 12,890  | 10,227 | 70,680  | 123   | 603     |

\*No pulpwood was entered at the other Pacific Coast customs districts.

**HOQUIAM, WASHINGTON**

The Hammervill Paper Co. of Erie, Pennsylvania, holds an interest in this new sulphite mill of the Grays Harbor Pulp & Paper Co. The 50-ton bond paper mill, seen in the foreground, began production in 1929. It converts to paper about one-third the company's bleached sulphite output. Much of the wood supply for the pulp mill comes from the waste of nearby saw mills.

## PACIFIC PULP &amp; PAPER INDUSTRY

REVIEW OF CANADIAN PRODUCTION AND EXPORTATION,  
1922 TO 1928

## Production

| Year | Quantities        |               |                | Total Values      |               |                |
|------|-------------------|---------------|----------------|-------------------|---------------|----------------|
|      | Pulpwood Produced | Pulp Produced | Paper Produced | Pulpwood Produced | Pulp Produced | Paper Produced |
|      | Cords             | Tons          | Tons           | Dollars           | Dollars       | Dollars        |
| 1922 | 3,923,940         | 2,150,251     | 1,366,815      | 50,735,361        | 84,947,598    | 107,085,766    |
| 1923 | 4,654,663         | 2,475,904     | 1,589,303      | 57,119,596        | 99,073,203    | 128,089,609    |
| 1924 | 4,647,201         | 2,465,011     | 1,718,741      | 57,777,640        | 90,323,972    | 133,395,673    |
| 1925 | 5,092,461         | 2,772,507     | 1,884,705      | 62,181,537        | 100,216,383   | 140,680,177    |
| 1926 | 5,621,305         | 3,229,791     | 2,266,143      | 68,100,303        | 115,154,199   | 158,277,078    |
| 1927 | 5,929,456         | 3,278,978     | 2,468,691      | 70,284,895        | 114,442,541   | 168,445,548    |
| 1928 | 6,328,586         | 3,608,045     | 2,849,199      | 74,848,077        | 121,184,214   | 184,462,356    |

## Exportation

| Year | Quantities        |               |                | Total Values      |               |                |
|------|-------------------|---------------|----------------|-------------------|---------------|----------------|
|      | Pulpwood Exported | Pulp Exported | Paper Exported | Pulpwood Exported | Pulp Exported | Paper Exported |
|      | Cords             | Tons          | Tons           | Dollars           | Dollars       | Dollars        |
| 1922 | 1,011,332         | 818,257       | Total          | 10,359,762        | 41,037,849    | 74,825,893     |
| 1923 | 1,384,230         | 875,358       | quantities     | 13,525,004        | 47,027,496    | 93,770,957     |
| 1924 | 1,330,250         | 781,983       | not            | 13,536,058        | 40,242,972    | 99,248,497     |
| 1925 | 1,423,502         | 961,367       | available      | 14,168,935        | 47,931,905    | 106,624,046    |
| 1926 | 1,391,738         | 1,005,779     |                | 14,067,030        | 52,022,122    | 121,414,513    |
| 1927 | 1,541,769         | 876,904       |                | 15,702,705        | 46,996,041    | 129,637,687    |
| 1928 | 1,532,266         | 863,800       |                | 15,269,660        | 45,614,823    | 147,156,792    |

Source—Canadian Department of Trade and Commerce, Dominion Bureau of Statistics, Forest Products Branch

WOOD PULP PRODUCTION IN CANADA—1928  
By Grades and Use—In Tons of 2,000 Lbs.

|                         | Groundwood |            | Bleached |            | Sulphite Unbleached |            | Sulphate |            | Screenings |           | All Other Wood Fibres |           |
|-------------------------|------------|------------|----------|------------|---------------------|------------|----------|------------|------------|-----------|-----------------------|-----------|
|                         | Tons       | Dollars    | Tons     | Dollars    | Tons                | Dollars    | Tons     | Dollars    | Tons       | Dollars   | Tons                  | Dollars   |
| Total                   | 2,127,699  | 47,549,324 | 304,769  | 22,451,771 | 812,458             | 35,359,990 | 256,969  | 13,581,559 | 87,591     | 1,134,702 | 18,559                | 1,106,868 |
| Made for own use        | 1,926,063  | 42,641,890 | 26,906   | 1,943,274  | 568,728             | 24,083,077 | 68,853   | 3,038,540  | 39,757     | 423,285   | 8,121                 | 439,268   |
| Made for sale in Canada | 11,091     | 296,010    | 28,987   | 2,225,092  | 42,991              | 1,888,204  | 12,801   | 707,804    | 15,915     | 204,843   | 6,089                 | 386,624   |
| Made for Export         | 190,545    | 4,611,424  | 248,876  | 18,283,405 | 200,739             | 9,388,709  | 175,315  | 9,835,215  | 31,919     | 506,574   | 4,349                 | 280,976   |

Total Production, All Grades: 3,608,045 tons; \$121,184,214.

Source—Canadian Department of Trade and Commerce, Dominion Bureau of Statistics, Forest Products Branch.

WHERE CANADA'S WOOD PULP EXPORTS WENT IN 1928  
By Grades—In Tons of 2,000 Lbs.

|                    | Groundwood |           | Bleached |            | Sulphite Unbleached |            | Sulphate or Kraft |           | Screenings |         |
|--------------------|------------|-----------|----------|------------|---------------------|------------|-------------------|-----------|------------|---------|
|                    | Tons       | Dollars   | Tons     | Dollars    | Tons                | Dollars    | Tons              | Dollars   | Tons       | Dollars |
| To United Kingdom  | 36,415     | 1,048,696 | 5,642    | 498,831    | 2,654               | 126,458    |                   |           |            |         |
| To United States   | 167,255    | 4,497,424 | 184,999  | 13,992,869 | 179,478             | 9,048,218  | 160,654           | 9,479,741 | 31,508     | 614,643 |
| To Other Countries |            |           | 60,900   | 4,621,264  | 31,994              | 1,564,301  | 2,116             | 116,125   | 184        | 6,253   |
| Total              | 203,670    | 5,546,120 | 251,541  | 19,112,964 | 214,126             | 10,738,977 | 162,770           | 9,595,866 | 31,692     | 620,896 |

Total Exports,\* All Grades: 863,800 tons; \$45,614,823.

\*To compute net exports, deduct Total Imports for 1928, amounting to \$1,107,801; of which \$1,107,625 were from United States; \$176 from other countries.

Source—Canadian Department of Trade and Commerce, Dominion Bureau of Statistics, Forest Products Branch.

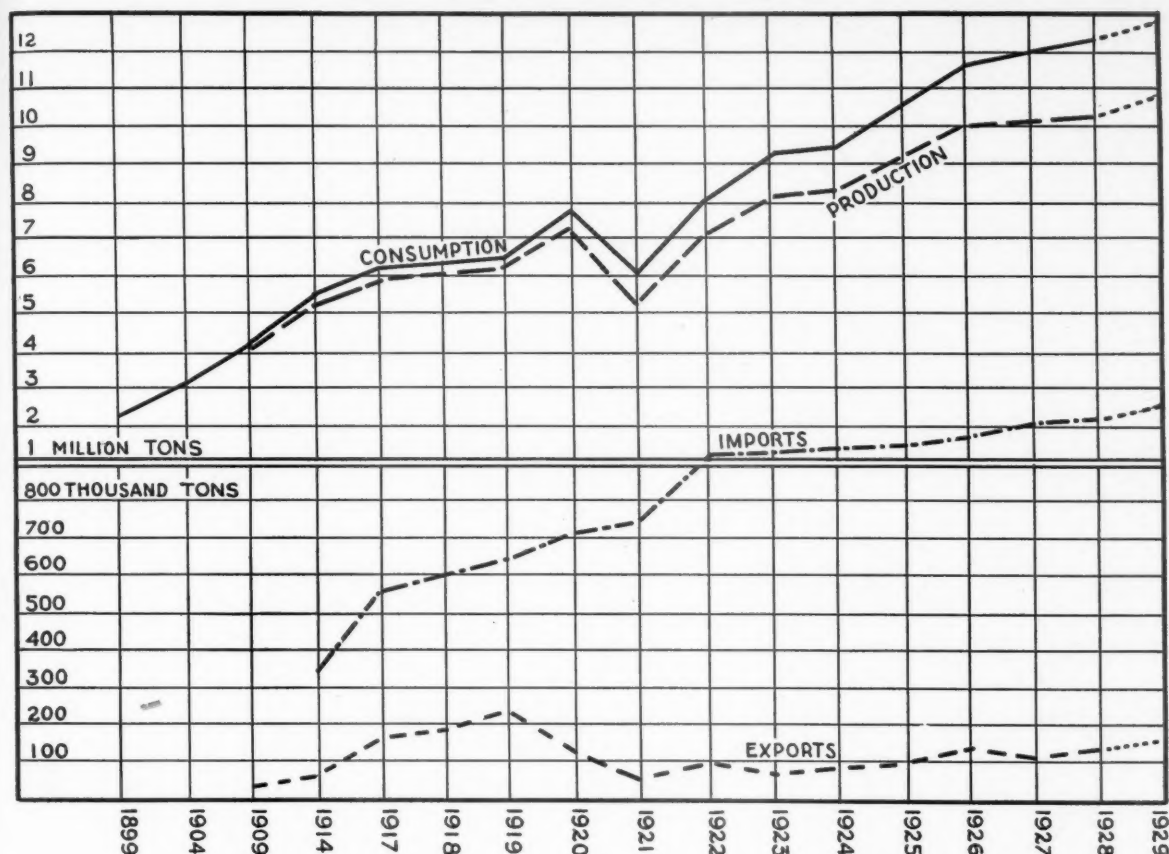
WHERE CANADA'S EXPORTS OF PAPER AND PAPER PRODUCTS WENT IN 1928  
By Grades—In Tons of 2,000 Lbs.

|                    | Newsprint |             | Wrapping Kraft |           | Wrapping n.o.p. |         | Pulp and Fibre Wallboards |         | Paper Board n.o.p. |           | All Other Paper and Paper Goods |           |
|--------------------|-----------|-------------|----------------|-----------|-----------------|---------|---------------------------|---------|--------------------|-----------|---------------------------------|-----------|
|                    | Tons      | Dollars     | Tons           | Dollars   | Tons            | Dollars | Tons                      | Dollars | Tons               | Dollars   | Tons                            | Dollars   |
| To United Kingdom  | 130,700   | 8,368,338   | 3,699          | 372,970   |                 |         | 3,528                     | 341,656 |                    | 355,950   |                                 | 303,177   |
| To United States   | 1,934,889 | 123,506,671 | 3              | 360       | 288             | 11,263  | 135                       | 11,314  |                    | 1,179,940 |                                 | 489,451   |
| To Other Countries | 140,998   | 9,228,518   | 12,360         | 1,382,322 | 604             | 92,406  | 2,733                     | 261,046 |                    | 105,083   |                                 | 1,146,327 |
| Total              | 2,206,587 | 141,103,527 | 16,062         | 1,755,562 | 892             | 103,669 | 6,396                     | 614,016 |                    | 1,640,973 |                                 | 1,938,955 |

Total Paper Exports\*, All Grades, \$147,156,792.

\*To compute net exports, deduct Total Imports of paper and paper products in 1928 amounting to \$13,260,288, of which \$1,502,398 were from United Kingdom, \$10,337,997 from United States; \$1,419,893 from Other Countries.

Source—Canadian Department of Trade and Commerce, Dominion Bureau of Statistics, Forest Products Branch.



Relation of United States Consumption, Production, Imports and Exports of Paper—1899-1929  
Based on data compiled by the U. S. Department of Commerce and the American Paper and Pulp Association

### PAPER PRODUCTION IN THE UNITED STATES—1923 - 1929

Compiled by the American Paper and Pulp Association

| Year  | Total Production<br>(Incl. "All Others") | Writing | Board     | Uncoated Book | Newsprint | Wrapping  | Tissue  |
|-------|--|---------|-----------|---------------|-----------|-----------|---------|
| 1923  | 8,029,482                                | 377,029 | 2,792,832 | 1,049,201     | 1,521,080 | 1,184,234 | 250,616 |
| 1924* | 8,300,000                                | 392,000 | 2,850,000 | 1,090,000     | 1,481,424 | 1,235,000 | 265,000 |
| 1925  | 9,182,204                                | 473,804 | 3,286,580 | 1,162,848     | 1,563,318 | 1,292,049 | 281,000 |
| 1926* | 9,750,000                                | 500,000 | 3,650,000 | 1,193,000     | 1,684,000 | 1,420,000 | 306,000 |
| 1927  | 10,002,070                               | 508,808 | 3,773,608 | 1,269,321     | 1,485,100 | 1,525,305 | 316,070 |
| 1928  | 10,403,338                               | 550,472 | 4,065,378 | 1,334,326     | 1,415,000 | 1,564,000 | 348,174 |
| 1929* | 10,984,000                               | 585,000 | 4,500,000 | 1,440,000     | 1,390,000 | 1,599,000 | 375,000 |

\*Estimated.

### REGIONAL PRODUCTION AND CONSUMPTION OF PAPER

Classified by Pulp Requirements—Estimates based on 1928 Statistics by American Paper and Pulp Association

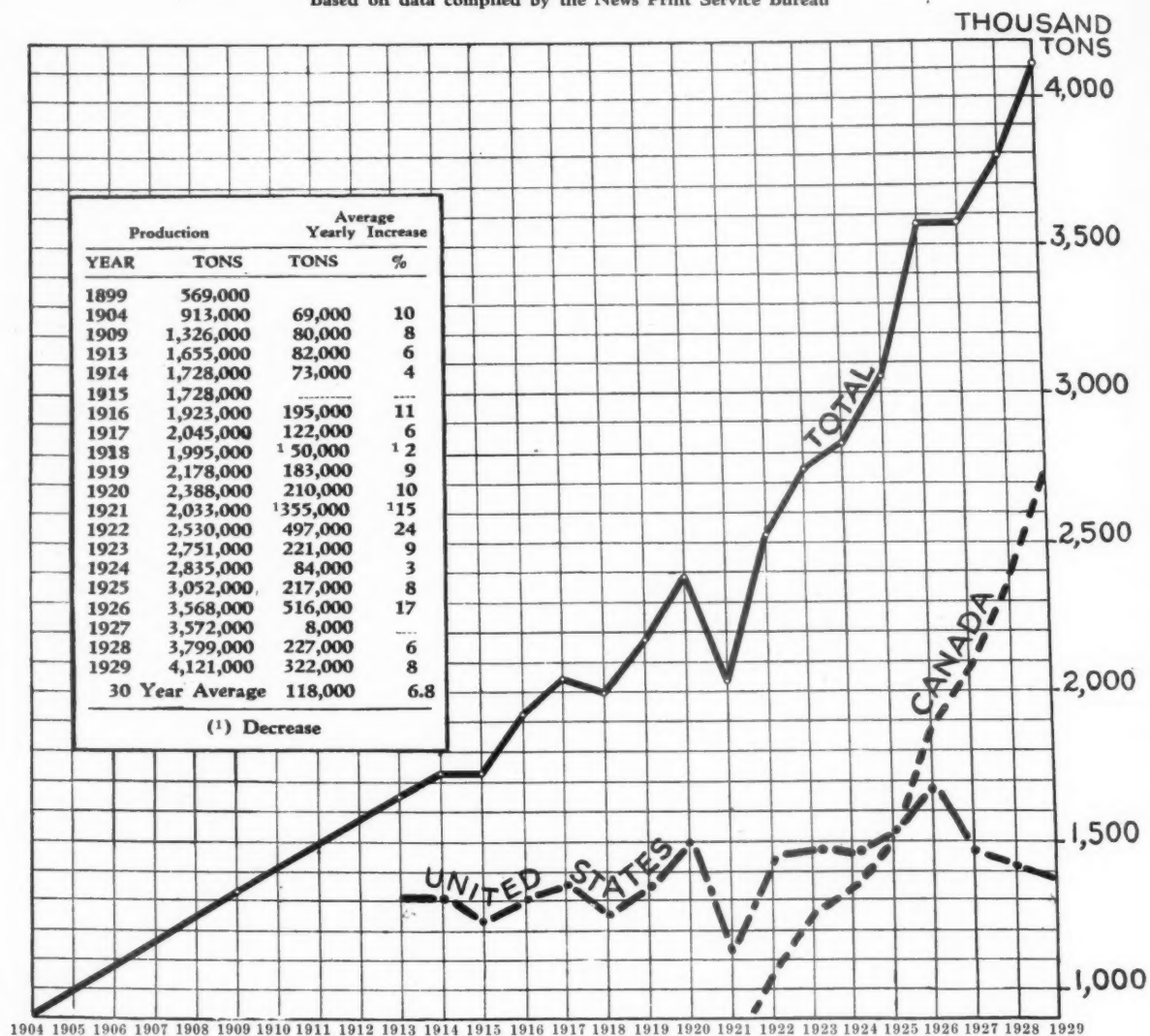
Quantities in Tons

| Region—               | Total<br>Production | Total<br>Consumption | Mechanical-Sulphite<br>Production | Mechanical-Sulphite<br>Consumption | Soda-Sulphate<br>Production | Soda-Sulphate<br>Consumption |
|-----------------------|---------------------|----------------------|-----------------------------------|------------------------------------|-----------------------------|------------------------------|
| United States         | 10,403,000          | 12,329,000           | 8,558,000                         | 9,494,000                          | 1,845,000                   | 2,835,000                    |
| New England           | 1,983,000           | 1,044,000            | 1,722,000                         | 828,000                            | 261,000                     | 216,000                      |
| Middle Atlantic       | 2,719,000           | 2,992,000            | 2,386,000                         | 2,331,000                          | 333,000                     | 661,000                      |
| Lake                  | 2,228,000           | 1,122,000            | 1,784,000                         | 860,000                            | 444,000                     | 262,000                      |
| Central               | 870,000             | 1,588,000            | 800,000                           | 1,227,000                          | 70,000                      | 361,000                      |
| Appalachian           | 986,000             | 1,249,000            | 820,000                           | 956,000                            | 166,000                     | 293,000                      |
| South                 | 852,000             | 1,942,000            | 398,000                           | 1,423,000                          | 454,000                     | 519,000                      |
| Prairie and Mountains | 73,000              | 1,455,000            | 73,000                            | 1,111,000                          |                             | 344,000                      |
| Pacific Coast         | 692,000             | 937,000              | 575,000                           | 758,000                            | 117,000                     | 179,000                      |



## NEWS PRINT PRODUCTION OF UNITED STATES AND CANADA—1899-1929

Based on data compiled by the News Print Service Bureau



## Pulp or Lumber

(Continued from page 82)

will find it more profitable to cease their pulp operations and buy pulp on the open market or seek new locations for plants, which they have done in many cases.

On the other hand, it would be foolish to expect that all of these mills are likely to cease operation within the next few years and come West to establish new mills. What they are most likely to do is to buy pulp on the open market although most of them would be better off in the long run if they would make proper connections here to manufacture their pulp as it is my impression that over a period of years there is going to be a gradual rise in the price of pulp.

More than anything in this discussion I have attempted to get you to appreciate the magnitude and soundness of the paper industry, its gradual but consistent growth and above all the part that the North Pacific Coast states must and will eventually take in its development. There will always be competition in the business but it will not come from our own coun-

try so far as pulp is concerned and with the industry firmly entrenched here where everything needed is available you need have no fear of the future. It has been said "the consumption of paper is a measure of a people's culture" and granting the truth of this statement the people of the United States are indeed cultured as compared to most other countries and if the balance of the world's population even becomes equally so or so only in a small measure the demand for paper will be such that it will tax the world's resources to supply it. If the pulp consumption of the people of this country is increased only one pound per year, it means the output of a 200-ton per day mill.

Paper mills will naturally follow the pulp mills but as long as there are in the neighborhood of 500 paper mills in the country craving for pulp it is likely the pulp output will increase faster here than paper output. I look to the Coast not only for our pulp in the future but a large proportion of our paper as well.

# The News Print Industry

## A Review by Years....1921 to 1929

**N**EW records in the production and distribution of news print paper in North America were made during 1929, with a total output of nearly 4,400,000 tons. Canadian overseas exports amounted to 338,000 tons and another 100,000 tons went overseas from Newfoundland. Domestic consumption in the United States and Canada combined was approximately 4,000,000 tons.

Operation for the industry as a whole was at 84% of rated capacity. New machines made ready for operation during the year had a daily capacity of 940 tons, and additional new machines expected to be ready to run before the end of 1930 will have a capacity of 720 tons more.

The detailed figures show in round numbers a production of 2,729,000 tons of news print in Canada last year; 1,392,000 tons in the United States; 256,000 tons in Newfoundland; and 19,000 tons in Mexico—Mexico being self-contained with respect to production and consumption. Compared with 1928, Canadian production increased 14.6%, Newfoundland, 10.7%, Mexican, 10%, while United States production decreased 1.8%. Shipments during the year totaled slightly more than production and mill stocks at the end of the year were 10,000 tons less in volume than at the beginning.

Canadian overseas shipments increased 24% and shipments to the United States 12%; exports of news print from the United States, which long ago ceased

to be an important factor, amounted to 19,000 tons in 1929, compared with 11,000 tons in the previous year. Imports of overseas news print into the United States, which averaged 137,000 tons yearly, 1921-28, inclusive, dropped to 96,000 tons in 1929. Stocks of white paper in the hands of the publishers were approximately 35,000 tons greater at the end of 1929 than at the beginning.

United States and Canada used a total of about 5% more news print paper in 1929 than in 1928, bringing the per capita consumption up to new high records of 62 lbs. in the United States and 44 lbs. in Canada. These two countries combined used about 57% of the world's supply of news print last year.

The North American news print industry is beginning 1930 with an average daily capacity of approximately 17,300 tons, of which in round numbers, Canada has 11,100 tons, United States 5,300 tons and Newfoundland 900 tons.

New operations scheduled for the year are three in number—two machines for the Canadian International Paper Company at Dalhousie, N. B., to start in February; two for the McLaren Company, Buckingham, Quebec, during the latter half of the year; and two for the Maine Seaboard Co., at Bucksport, Maine, at the end of 1930.

\*Abstract of report by Royal S. Kellogg, Secretary at the Annual Meeting of the News Print Service Bureau in Montreal, January 31, 1930.

|                                  |  | PRODUCTION             |                          |                                     |                                       | SHIPMENTS         |                    |                |
|----------------------------------|--|------------------------|--------------------------|-------------------------------------|---------------------------------------|-------------------|--------------------|----------------|
|                                  |  | Rating Tons<br>Per Day | Actual Tons<br>Per Month | Actual Tons<br>Per<br>Operating Day | Per Cent Rating<br>(Totals Per Month) | Tons<br>Per Month | Per Cent<br>Rating | MILL<br>STOCKS |
| CANADIAN MILLS                   |  |                        |                          |                                     |                                       |                   |                    |                |
| 1929—Twelve Months               |  | 10,326                 | 2,728,827                | 9,533                               | 85.5                                  | 2,722,381         | 85.3               | 24,946         |
| 1928—Twelve Months               |  | 9,398                  | 2,381,102                | 8,485                               | 82.0                                  | 2,399,030         | 82.6               | 19,139         |
| 1927—" "                         |  |                        | 2,086,949                |                                     |                                       | 2,062,749         |                    | 38,117         |
| 1926—" "                         |  |                        | 1,881,737                |                                     |                                       | 1,878,746         |                    | 14,345         |
| 1925—" "                         |  |                        | 1,522,217                |                                     |                                       | 1,525,150         |                    | 18,414         |
| 1924—" "                         |  |                        | 1,352,994                |                                     |                                       | 1,344,757         |                    | 21,954         |
| 1923—" "                         |  |                        | 1,266,232                |                                     |                                       | 1,257,521         |                    | 15,123         |
| 1922—" "                         |  |                        | 1,081,916                |                                     |                                       | 1,087,572         |                    | 7,573          |
| 1921—" "                         |  |                        | 808,066                  |                                     |                                       | 803,162           |                    | 13,896         |
| UNITED STATES MILLS              |  |                        |                          |                                     |                                       |                   |                    |                |
| 1929—Twelve Months               |  | 5,615                  | 1,392,276                | 4,612                               | 80.0                                  | 1,409,239         | 81.0               | 19,023         |
| 1928—Twelve Months               |  | 5,580                  | 1,417,572                | 4,782                               | 81.9                                  | 1,399,425         | 80.9               | 34,469         |
| 1927—" "                         |  |                        | 1,485,495                |                                     |                                       | 1,474,521         |                    | 20,877         |
| 1926—" "                         |  |                        | 1,684,218                |                                     |                                       | 1,684,790         |                    | 12,030         |
| 1925—" "                         |  |                        | 1,530,318                |                                     |                                       | 1,534,345         |                    | 16,238         |
| 1924—" "                         |  |                        | 1,481,425                |                                     |                                       | 1,480,819         |                    | 23,757         |
| 1923—" "                         |  |                        | 1,485,000                |                                     |                                       | 1,477,332         |                    | 23,669         |
| 1922—" "                         |  |                        | 1,447,688                |                                     |                                       | 1,452,414         |                    | 19,208         |
| 1921—" "                         |  |                        | 1,225,235                |                                     |                                       | 1,226,064         |                    | 23,934         |
| UNITED STATES AND CANADIAN MILLS |  |                        |                          |                                     |                                       |                   |                    |                |
| 1929—Twelve Months               |  | 15,941                 | 4,121,103                | 14,145                              | 83.6                                  | 4,131,620         | 83.8               | 43,969         |
| 1928—Twelve Months               |  | 14,978                 | 3,798,674                | 13,267                              | 82.0                                  | 3,798,455         | 82.0               | 53,608         |
| 1927—" "                         |  |                        | 3,572,444                |                                     |                                       | 3,537,270         |                    | 58,994         |
| 1926—" "                         |  |                        | 3,565,955                |                                     |                                       | 3,563,536         |                    | 26,375         |
| 1925—" "                         |  |                        | 3,052,535                |                                     |                                       | 3,059,495         |                    | 34,652         |
| 1924—" "                         |  |                        | 2,834,419                |                                     |                                       | 2,825,576         |                    | 45,711         |
| 1923—" "                         |  |                        | 2,751,232                |                                     |                                       | 2,734,853         |                    | 38,792         |
| 1922—" "                         |  |                        | 2,529,604                |                                     |                                       | 2,539,986         |                    | 26,781         |
| 1921—" "                         |  |                        | 2,033,301                |                                     |                                       | 2,029,226         |                    | 37,830         |
| NORTH AMERICAN PRODUCTION        |  |                        |                          |                                     |                                       |                   |                    |                |
|                                  |  | Canada                 | United States            | Newfoundland                        | Mexico                                | Total             |                    |                |
| 1929—Twelve Months               |  | 2,728,827              | 1,392,276                | 255,500                             | 18,680                                | 4,395,283         |                    |                |
| 1928—Twelve Months               |  | 2,381,102              | 1,417,572                | 230,745                             | 16,981                                | 4,046,400         |                    |                |
| 1927—" "                         |  | 2,086,949              | 1,485,495                | 202,852                             | 14,137                                | 3,789,433         |                    |                |
| 1926—" "                         |  | 1,881,737              | 1,684,218                | 186,471                             | 13,412                                | 3,765,838         |                    |                |
| 1925—" "                         |  | 1,522,217              | 1,530,318                | 96,588                              | 12,681                                | 3,161,804         |                    |                |
| 1924—" "                         |  | 1,352,994              | 1,481,425                | 64,648                              | 11,500                                | 2,910,567         |                    |                |
| 1923—" "                         |  | 1,266,232              | 1,485,000                | 63,906                              | 12,000                                | 2,827,138         |                    |                |

# FOREIGN TRADE

of the United States in 1929

## Pulp, Paper and Manufactures

A summary prepared by the  
U. S. DEPARTMENT OF COMMERCE

**E**XPORTS of paper and paper products from the United States during 1929 again reached a record mark with a valuation of \$37,379,685—surpassing the previous year's high figure by \$6,447,000, or 20 per cent. It is noteworthy also that these exports have maintained the consistent rise from month to month as compared with the preceding year's that characterized the 1928 shipments—the last quarter's exports in 1929 exceeding those of the corresponding quarter in 1928 by 12 per cent, while the valuation of the December shipments surpassed those of the same month in 1928 by 17 per cent.

From the standpoint of volume, an even greater gain was doubtless realized, because most items on the paper

export schedule continue to show a proportionately larger gain in quantity than in value. This holds true for the leading items and for those classes in which American paper exporters are increasing their sales to the greatest extent, as well as for those of lesser importance.

Altho the heaviest gains were registered in exports of printing papers and building boards, with few exceptions all classes of paper and board shared in the increased sales to foreign countries during 1929.

Printing paper shared with building boards the distinction of having registered the most outstanding gains during the past year. Exports of newsprint for 1929 maintained a consistent lead over the previous year, notwithstanding a slump during the spring and summer months. Exports of book paper were greater in volume than in any year since 1922, and this same statement may be also made in regard to surface coated papers. Cover paper exports were about on a level with those of 1928.

### EXPORTS OF PAPER AND PAPER PRODUCTS FROM THE UNITED STATES

| Class   | 1928               |                     | 1929               |                     |
|---|--------------------|---------------------|--------------------|---------------------|
|   | Quantity<br>Pounds | Value               | Quantity<br>Pounds | Value               |
| Newsprint .....   | 22,779,930         | \$865,956           | 37,391,882         | \$1,346,018         |
| Book paper, not coated                                    | 24,510,519         | 1,789,694           | 37,817,028         | 2,651,325           |
| Cover paper .....   | 2,037,523          | 240,972             | 2,033,996          | 356,445             |
| Greaseproof and water-proof paper .....                   | 3,107,467          | 489,647             | 2,908,120          | 526,281             |
| Over-issue newspapers .....                               | ( <sup>1</sup> )   | ( <sup>1</sup> )    | 154,078,379        | 1,668,085           |
| Wrapping paper .....                                      | 36,757,253         | 2,586,848           | 43,882,689         | 2,957,204           |
| Surface-coated paper .....                                | 11,156,835         | 1,137,134           | 17,317,750         | 1,576,916           |
| Tissue and crepe paper .....                              | 4,995,465          | 1,096,424           | 4,798,279          | 1,061,250           |
| Toilet paper .....  | 6,448,053          | 685,478             | 7,030,815          | 787,919             |
| Towels and napkins .....                                  | 3,018,379          | 399,910             | 3,617,890          | 435,308             |
| Boxboards .....   | 48,669,581         | 1,353,561           | 53,458,595         | 1,614,535           |
| Bristols and bristol boards .....                         | 1,979,152          | 220,966             | 2,908,260          | 286,400             |
| Other paper boards and strawboard .....                   | 42,124,168         | 2,149,565           | 47,315,391         | 2,096,798           |
| Sheathing and building papers .....                       | 14,854,482         | 551,059             | 22,475,764         | 756,329             |
| Fiber insulating board and lath .....                     | ( <sup>2</sup> )   | ( <sup>2</sup> )    | 30,324,245         | 1,026,312           |
| Wall boards of paper pulp .....                           | 61,600,700         | 2,068,788           | 68,049,488         | 2,220,879           |
| Blotting paper .....                                      | 3,920,957          | 445,510             | 3,606,483          | 428,997             |
| Filing folders, index cards, and other office forms ..... | 1,502,400          | 516,123             | 1,633,954          | 599,260             |
| Papeteries .....  | 752,040            | 196,079             | 855,149            | 207,990             |
| Other writing paper .....                                 | 25,833,846         | 2,832,934           | 27,989,532         | 2,955,587           |
| Wall paper and hanging paper .....                        | 33,950,960         | 641,570             | 27,434,475         | 581,684             |
| Paper bags .....  | 9,155,249          | 801,027             | 12,061,231         | 1,010,522           |
| Boxes and cartons .....                                   | 28,448,969         | 1,900,825           | 28,120,494         | 1,891,939           |
| Envelopes .....   | 2,453,119          | 405,505             | 2,421,472          | 428,551             |
| Vulcanized fiber in sheets, strips, rods, and tubes ..... | 5,523,712          | 1,455,175           | 6,116,832          | 1,487,714           |
| Manufacturers of vulcanized and indurated fiber .....     | 467,713            | 136,432             | 383,109            | 103,477             |
| Cash register and adding machine paper .....              | 3,419,258          | 359,140             | 5,507,358          | 522,125             |
| Other paper and paper products .....                      |                    | 5,506,809           |                    | 5,793,835           |
| <b>Total</b> .....  |                    | <b>\$30,933,131</b> |                    | <b>\$37,379,685</b> |

<sup>1</sup> Included prior to 1929 under classification "Rags and other paper stock."

<sup>2</sup> Included prior to 1929 under classification "Wall boards."

<sup>3</sup> Square feet.

<sup>4</sup> Yards.

### IMPORTS OF PAPER AND PAPER PRODUCTS INTO THE UNITED STATES

| Class  | 1928            |                    | 1929       |                    |
|--|-----------------|--------------------|------------|--------------------|
|  | Quantity        | Value              | Quantity   | Value              |
| Standard newsprint .....                           | 1,926,042 tons  | \$139,432,918      | 2,163,126  | \$144,492,736      |
| All other, n.e.s. lbs. ....                        | 7,339,078       | 342,991            | 4,359,782  | 220,509            |
| Grease-proof and water-proof papers .....          | 1,261,844 lbs.  | 231,621            | 1,776,599  | 460,137            |
| Kraft wrapping paper .....                         | 10,762,437 lbs. | 460,294            | 9,796,151  | 423,187            |
| Other wrapping paper .....                         | 16,223,695 lbs. | 392,262            | 7,115,166  | 221,278            |
| Writing, letter, drawing, etc., papers, lbs. ....  | 3,107,574       | 806,502            | 3,226,740  | 892,952            |
| Surface-coated paper .....                         | 2,370,859 lbs.  | 1,103,611          | 2,452,236  | 1,046,201          |
| Tissue, copying, etc., papers .....                | 3,569,399 lbs.  | 2,052,872          | 5,008,881  | 2,667,680          |
| Paper boards, n.e.s.: Pulp boards in rolls .....   | 52,770,222 lbs. | 1,150,968          | 58,724,555 | 1,271,740          |
| Paper boards, pulp board and cardboard .....       | 21,105,834 lbs. | 470,289            | 20,488,302 | 486,231            |
| Leather board, test and wall board .....           | 880,051 lbs.    | 27,434             | 2,048,444  | 86,106             |
| Cigarette paper, cigarette books, and covers ..... | 11,689,018 lbs. | 3,213,981          | 11,687,109 | 3,921,984          |
| Hanging paper (wall paper) .....                   | 2,164,176 lbs.  | 657,163            | 2,875,860  | 750,027            |
| Duplex, decalcomania paper, not printed .....      | 626,467 lbs.    | 141,704            | 585,524    | 145,870            |
| Paper boxes .....                                  |                 | 1,789,421          |            | 1,720,093          |
| Pulp or papier-mache and manufactures, n.e.s. .... |                 | 435,633            |            | 580,547            |
| All other paper and manufactures .....             |                 | 3,696,888          |            | 3,797,049          |
| <b>Total</b> .....                                 |                 | <b>156,406,552</b> |            | <b>163,184,327</b> |

Altho exceeding those of 1928, exports of writing paper failed to show the substantial gains that have characterized them during the past few years. Wrapping paper exports were the highest of any year since 1920 when they reached a total of 61,264,500 pounds. The 1929 shipments, amounting to 43,882,700 pounds were 20 per cent above those of the preceding year, and 50 per cent above the annual average of the preceding five years. A heavy decrease in shipments during the past few years. Exports of boards second quarter of 1929, and to a less extent during the last three months of the year, caused the total shipments to fall 6 per cent under those recorded for the previous year.

#### Increased Exports of Base Stocks

Exports of paper base stocks from the United States during the past year show a slight decrease in value, as compared with 1928, attributable largely to the fact that overissue newspapers—previously included under the classification "rags and other paper stock"—was transferred to the paper schedule. Had this item been included as in previous years, shipments of this group during 1929 would have shown an increase of \$643,000, or somewhat more than 10 per cent as compared with 1928. Shipments of "rags and other paper stock" continue to take first rank from the standpoint of volume, amounting last year to 48,400 tons (long ton of 2,240 pounds), as compared with 39,154 tons of sulphite pulp. The remaining exports comprised 9,121 tons of other classes of wood pulp and 52,682 cords of pulpwood.

#### EXPORTS OF PAPER BASE STOCKS FROM THE UNITED STATES

| Class                            | 1928     |           | 1929     |           |
|----------------------------------|----------|-----------|----------|-----------|
|                                  | Quantity | Value     | Quantity | Value     |
| Pulpwood .....                   | 27,518   | \$221,259 | 52,682   | \$464,313 |
| Sulphite wood pulp .....         | 22,272   | 1,308,459 | 39,154   | 2,116,428 |
| Soda wood pulp .....             | 2,441    | 194,325   | 1,961    | 159,988   |
| Other wood pulp .....            | 5,183    | 276,395   | 7,160    | 453,007   |
| Rags and other paper stock ..... | 102,958  | 4,103,118 | 48,400   | 1,884,610 |
| Total .....                      |          | 6,103,556 |          | 5,078,346 |

#### Increase in Paper Imports

Imports of paper and paper products into the United States during 1929 in most instances show an increase, the aggregate shipments having registered a gain of 4 per cent. The outstanding item, as usual, in this group is standard newsprint, receipts of which during the past year totaled 2,163,100 tons, valued at \$144,-

492,700—an increase in volume of 12 per cent and in value of 4 per cent, as compared with the previous year's receipts. Imports of the remaining classes totaled \$18,971,600—an increase of 11 per cent over those of the previous year. Prominent among these items are pulpboards in rolls, leatherboard, test boards, and wall boards, surface-coated papers, and wall papers, receipts of which in each instance were greater than in 1928. On the other hand, imports of printing papers (other than standard newsprint) declined by 40 per cent, kraft wrappings by 10 per cent, and other wrapping papers by 56 per cent.

#### Increase in Paper Base Stocks

Importations of paper base stocks into the United States during 1929 in most instances show a substantial increase over the preceding year. Receipts of sulphite wood pulp—which in value represents somewhat more than one-half of the total receipts—increased by 10 per cent, and the same gain was recorded in incoming shipments of mechanical ground wood. Imports of sulphate pulp, however, were practically on a level with 1928, while those of pulpwood registered a decrease of 12 per cent. In the waste group, old rope and similar materials increased by 85 per cent and rags by 4 per cent, while waste bagging, waste paper, etc., declined by 5 per cent.

Total importations of paper base stocks during 1929 were valued at \$118,132,740 as against \$112,295,501 in the preceding year.

#### IMPORTS OF PAPER BASE STOCKS INTO THE UNITED STATES

| Class   | 1928        |              | 1929        |              |
|---|-------------|--------------|-------------|--------------|
|   | Quantity    | Value        | Quantity    | Value        |
| Pulpwood .....                                    | 1,546,338   | \$16,157,295 | 1,350,722   | \$14,598,949 |
| Mechanically ground wood pulp .....               | 222,499     | 5,443,495    | 244,162     | 6,245,776    |
| Sulphite wood pulp .....                          | 948,586     | 55,955,558   | 1,035,691   | 60,667,585   |
| Sulphate wood pulp, unbleached (kraft pulp) ..... | 381,256     | 21,170,948   | 384,005     | 20,518,676   |
| Sulphate wood pulp, bleached .....                | 14,590      | 894,587      | 15,364      | 1,139,820    |
| Other pulp .....                                  | 6,728       | 455,190      | 6,050       | 514,139      |
| Rags for paper stock .....                        | 429,892,896 | 8,195,224    | 446,496,028 | 9,341,795    |
| Waste bagging, waste paper, etc. ....             | 148,756,214 | 1,957,937    | 141,615,462 | 1,657,562    |
| Old rope and all other paper stock .....          | 70,723,965  | 2,065,267    | 131,084,841 | 3,448,438    |
| Total .....                                       |             | 112,295,501  |             | 118,132,740  |

Tidewater locations of many Pacific Coast pulp and paper mills enable them to participate in foreign trade to advantage. Shown is a waterfront scene at Hoquiam, Washington, with the mill of the Grays Harbor Pulp & Paper Co. in the distance.





# Stream Pollution Problems of the Pacific Coast

By C. M. BAKER, Engineer  
American Paper & Pulp Association

Written expressly for the 1930 Review Number of  
PACIFIC PULP and PAPER INDUSTRY



STREAM pollution problems on the Pacific Coast are, in most respects, analagous to those in other sections of the country. There are, however, certain local problems peculiar to this section, largely because of the importance of the fishing industry rather than any peculiar classification or phenomena regarding the wastes or

types of pollution. This discussion will deal primarily with pollution from pulp and paper mills, although basic principles developed apply to all classes of pollution.

## Basic Principles

In order to enter into an intelligent discussion of this subject certain basic principles should be presented.

Contrary to the general conception, industrial wastes are seldom toxic or poisonous to fish, nor do they directly affect the public health. Domestic sewage from municipalities constitutes the greatest menace to the public health, but industrial wastes may cause greater danger to fish life.

Based upon the effect upon the stream and its aquatic life, pollution may be classified as bacterial, organic, suspended matter, and toxic or poisonous. Bacterial pollution, particularly from domestic sewage, is of importance because of its effect upon the public health. Organic pollution, due to its oxygen demand, constitutes the greatest menace to fish life. Suspended matter may effect fish life due to the accumulation of sludge. Seldom are industrial wastes present in sufficient quantities to become toxic or poisonous.

Sufficient space is not available for a detailed discussion, but in general the basic data involved in problems of stream pollution may be summarized as follows:

1. The discharge of industrial wastes into water courses is the only practical method of ultimate disposal in many cases, and constitutes a necessary and proper use of the water course provided the dilution is so great there is no menace to public health nor material interference with the natural aquatic life.

2. Factors affecting fish life include:

- (a) Reduction of the dissolved oxygen of the stream due to natural oxidation of the organic matter. If the dissolved oxygen becomes 2 parts per million or less for a material length of time fish die or seek other habitat.  $3\frac{1}{2}$  to 4 parts per million is satisfactory for fish life.

- (b) Some wastes, such as gas plant wastes, mine drainage and certain chemical wastes are toxic or poisonous to fish. Seldom, however, are they present in sufficient concentration to be actually injurious.

- (c) Plant growth is necessary to fish life, and fish may seek other habitat because of changes in the plant or aquatic life, even though other environmental conditions are satisfactory.

- (d) Pollution and other unfavorable conditions are more deleterious to young fish, particularly just after absorption of the food sac, than to adult fish.

- (e) The discharge of large quantities of suspended matter may form sludge beds in the stream and interfere with the spawning and spawn.

3. Nearly all wastes, either through chemical or biological reaction, cause reduction of the dissolved oxygen normally present in the stream, industrial wastes generally having a greater oxygen demand than domestic sewage.

4. During warm weather biological oxidation is more rapid than in cold, so that the oxygen demand of the waste then is greater, altho the actual amount of oxygen available is less because warm water retains less oxygen in solution. Furthermore the tolerance of fish is less in warm than in cold water, and its oxygen requirements are greater.

5. When the dissolved oxygen of a stream is depleted green plants and other classes of aerobic life die, and anaerobic organisms, such as worms and lower animal life prevail.

6. A stream tends to purify itself by natural processes, and will ultimately return practically to normal if the concentration of the waste is not too great and sufficient time elapses before there is additional pollution.

## Wisconsin Stream Surveys

During the summer of 1926 careful stream surveys were made of two typical Wisconsin streams. A rather detailed description will be given of one of these since it is characteristic of certain conditions prevailing upon the Pacific Coast, as will be pointed out later.

The Lower Fox River is a stream some 38 miles in length, connecting Lake Winnebago, a large inland lake, with Green Bay, a large body of water tributary to Lake Michigan. There are six cities on this stream with a total population of about 88,000.

Analyses made in this survey indicated that, under normal operating conditions:

1. The waste liquor from a sulphate pulp mill is equivalent to the untreated domestic sewage from 1,630 persons per ton of daily mill capacity.
2. The waste from a sulphate or soda mill is equivalent to 500 persons, and
4. The white water from a paper machine to 50 persons per ton of capacity.

These figures applied to the pulp and paper mill wastes indicate a population equivalent of about 744,000

for industrial wastes, or with the domestic sewage, a total pollution load tributary to the Fox equivalent to the untreated domestic sewage from 832,000 people.

The stream throughout practically the entire length consists of a series of dams and pools used for power developments. Lake Winnebago, the source, is practically unpolluted but pollution enters the stream in varying degrees of concentration throughout its length.

The survey consisted of frequent dissolved oxygen determinations, coupled with careful biological studies. There was a successive reduction in the dissolved oxygen below sources of pollution, so that critical conditions prevailed in the vicinity of Wrightstown about 20 miles below Lake Winnebago. During the month of August, with an average oxygen content dropped to approximately 2 parts per million, the critical point for fish, while during September, with a flow of about 4000 second feet, the dissolved oxygen remained rather uniform at about  $3\frac{1}{2}$  parts per million, satisfactory for fish.

The total population equivalent of domestic sewage and industrial wastes above Wrightstown is about 613,000. Dividing the average flow by this figure indicates that a flow of approximately 5 cubic feet per second is required per 1000 persons, to maintain 2 parts per million of dissolved oxygen, and  $6\frac{1}{2}$  second feet to maintain  $3\frac{1}{2}$  parts per million of dissolved oxygen for this character of stream.

In terms of capacity of a sulphite mill the corresponding requirements are approximately 9 to 12 cubic feet per second per ton of capacity.

The biological survey, which was carried in parallel with the chemical surveys, demonstrated rather conclusively that fish die or seek other habitat where the dissolved oxygen became less than 2 parts per million. Fish were found present, however, in all cases where the dissolved oxygen was  $3\frac{1}{2}$  parts per million or more, except possibly in certain places where there had been earlier depletion of the oxygen so that the fish had been driven out prior to the observations.

This conclusion, with reference to the amount of dissolved oxygen necessary to sustain fish life, has been confirmed by other investigations. In fact it is pretty generally conceded that if the dissolved oxygen becomes less than 2 parts per million, fish will die or seek other habitat, but if maintained at  $3\frac{1}{2}$  or 4 parts per million, about 50 per cent saturation, satisfactory conditions prevail.

#### Pacific Coast Problems

Stream pollution problems on the Pacific Coast are different in each of the three states. In Washington there is concern because of the possible effect of sulphite waste liquor upon the oyster industry. In Oregon, conditions on the Willamette River are very analogous to those on the Fox in Wisconsin. A mill in California has encountered difficulty because its waste pollutes the source of the public water supply for a city in a neighboring state.

#### Washington

Legislation makes it unlawful to discharge into any of the waters of the state "any sawdust, planer shavings, wood pulp or other wastes,—or any other chemical substance, except coal mine waste or drainage, in quantities sufficient in the judgment of the State Fisheries Board and the State Board of Health to injuriously affect, destroy, or diminish the growth of the plankton ——— algae, or the fish or shellfish ———." Rules and regulations of the Department of Fisheries require

that "All manufacturing and industrial plants proposed for establishment on or adjacent to the waters of the state shall submit plans and specifications" for approval regarding waste disposal. The Department of Fisheries and Board of Health are required to cooperate in making investigations.

It is rather interesting to note the class distinction in exempting coal mines from the restrictions regarding pollution. There is a similar provision in the West Virginia laws. It would seem that this is very nearly class legislation.

There appears to be more agitation and concern in

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Washington regarding the general problem of stream pollution than in any other of the Pacific States. This situation centers primarily in Oakland Bay near Shelton where certain oyster beds are not reproducing satisfactorily. The fishing interests contend that the waste liquor from a sulphite mill is the cause.

The question of waste disposal at the Shelton mill, however, was taken up with mill officials before operation was commenced. Altho it is understood that at that time there was no mandatory legislation, the mill agreed to pump its sulphite waste liquor some six or seven miles, store it in tanks, and discharge into the bay with the outgoing tide. The point of discharge is eight or ten miles from the oyster beds. Careful chemical and biological surveys have been made both prior and subsequent to the operation of the mill. These have been conducted both by representatives of the mill and the State Board of Health.

The following statement is made on conclusions based upon a recent investigation by the State Board of Health:

"Investigations of July and August, 1929, as well as previous observations in Oakland Bay, fail to demonstrate that an accumulation of sulphite liquor exists in the sea water over the oyster grounds in this bay. Dissolved oxygen samples taken over these grounds do not show evidence of an accumulation of sulphite liquor which has a high secondary oxygen demand. The infrequent occurrence of pulp fibre in small numbers in the water over the oyster beds further substantiates this conclusion."

Investigations by representatives of the mill also have failed to detect the presence of sulphite waste liquor in the vicinity of the oyster beds, or any reason for apprehension on the part of the oyster industry. Nevertheless, the contention is still made that this waste is affecting the propagation of oysters in this vicinity. In

view of the various factors involved an investigation has been commenced by the Federal Bureau of Fisheries, but no definite conclusions have yet been reached.

Investigations by the writer, in Wisconsin and other places, have failed to indicate any toxic or poisonous effect of sulphite waste liquor upon fish or other aquatic life. In each case, where critical conditions have prevailed, the deleterious effects have been due to reduction of the dissolved oxygen normally present in the water. This conclusion appears to be borne out by investigations by H. W. Nightingale\*, State Sanitary Engineer of Washington.

In these investigations Mr. Nightingale tested the effect of various concentrations of sulphite waste liquor upon Chinook salmon. He found that the fingerling salmon live for 146 hours in a concentration of one part of sulphite waste liquor in 100 parts of water. It is significant that the critical stage in practically all instances was coincident with a reduction in dissolved oxygen. In any event, these experiments demonstrated that much greater concentrations were required to kill Chinook salmon with fresh sulphite waste liquor than resulted in depletion of oxygen causing suffocation of fish in the Fox River of Wisconsin.

While previous investigations have failed to indicate that sulphite waste liquor is actually affecting the oyster industry in Oakland Bay, two industries are involved in a controversy of such public concern that the governor of the state called a special hearing upon the problem. The situation is, therefore, one of importance to the pulp and paper industry. Should an ultimate conclusion be reached that is adverse to the Shelton mill the results might have a material effect upon the whole pulp industry in the Puget Sound area.

The oyster industry in the East has encountered difficulty because of contamination of the oysters by pollution from the domestic sewage of municipalities. Several outbreaks of typhoid fever have been traced to such contaminations. The writer is not informed as to whether similar conditions may exist on the Pacific Coast. In any event this is a source of danger that should not be overlooked.

#### Oregon

The critical situation regarding pollution in Oregon is in the Willamette River in the vicinity of Portland.

In the spring of 1929 a conference was held at the State University, Eugene, to discuss the problem of stream pollution in this state. This meeting resulted in the appointment of a committee consisting of representatives from industry, sportsmen's organizations, the State Department of Health, the State College, the University, and other interests, to study the problem during the coming summer. Representatives of this committee from the State College have made surveys of the Willamette during the past summer and have certain analytical data available.

The Oregon Committee is preparing a report upon its investigation which will probably form the basis of legislation during the next session to develop a constructive program for stream improvement. A rational program with due consideration of industry appears to have been adopted.

#### California

The outstanding situation in California is in connection with the wastes from a sulphite mill which it is claimed interferes with the public water supply of a city in a neighboring state. This problem has been a matter

of litigation and the courts have placed a very stringent regulation upon the mill resulting in a financial burden in its operation. Chemical and biological surveys indicate rather definitely the effect of the wastes from the mill upon the stream, although the writer has failed to find any definite data as to the manner in which the wastes affect the public water supply.

#### Fallacies

At Longview, Wash., it was claimed that wastes from a sulphate mill interfered with the run of smelt up the stream. Fishermen have claimed that these fish run up this stream every other year. Two years following installation of the mill there were no smelt but last year, the third, there was a greater run of smelt than ever before, apparently refuting the contention that the mill wastes have destroyed this class of fishing.

About a year ago the writer received photographs and a news clipping alleging that sulphite mill waste was killing steelheads in Grays Harbor near Hoquiam, Wash. The photographs showed pictures of fish with the eyes gone, scarred about the fins, and in a generally lacerated condition. In our Wisconsin experiences no such conditions were observed in any instance.

While visiting the state fish hatchery at Auburn, Wash., numerous fish were observed that appeared to be duplicates of those shown in the photographs. The facts are that the water was very low in the season when complaint was made at Hoquiam, so that the fish did not run up the stream to spawn as under normal conditions, but stayed in the bay. In their fight for existence and reproduction of the species these fish always became scarred, lacerated, and finally die. Apparently the wastes from the mill had nothing whatsoever to do with the situation.

These illustrations at Longview and Hoquiam show the fallacy of jumping at conclusions. Such reports and publicity are deleterious alike to industry and a general constructive program of stream improvement. They indicate the opinions of a misinformed few rather than the sound, mature judgment resulting from a careful study and consideration of the problem.

#### Cooperation the Solution

It has been pointed out that the discharge of industrial wastes into water courses constitutes a proper, and in many cases the only, method of ultimate disposal. Unless such is the case many classes of industry could not operate. Prohibitory legislation or policies are, therefore, unsound, impossible of enforcement and inimical to the public interest.

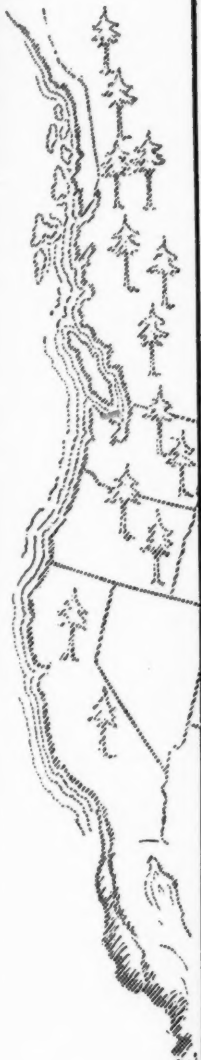
Control and regulation of pollution is essential. This can be best accomplished, however, through a constructive, cooperative program between industry, state officials and other interests, to study and develop rational, practical and economical solutions of the various problems. Such a program of industrial waste disposal may be divided into three definite steps as follows:

1. Utilization of the wastes within the industry, which is primarily a problem for industry itself, and should be given first consideration.
2. Treatment of the residual wastes after as complete utilization as practical, which is more specifically a problem for sanitary engineers and state officials in cooperation with industry.
3. Stream surveys to determine the effect of the wastes upon the stream, the extent of waste treatment necessary, and the results of improvements made, which is primarily a function of the state.

\*See Pacific Pulp & Paper Industry, September, 1928, page 30.



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Supplement to Pacific Pulp & Paper Industry

**ROBERT BELL-IRVING**  
Mill Manager, Powell River Co. Ltd.





# JAPAN

## Gateway to the East

By GORDON W. LAND

Kobe, Japan



SOME months ago I received a letter from an American company addressed to me at Kobe, Shanghai and, as I idly mused at this ignorance on someone's part, two thoughts occurred to me. One, that the writer displayed a lack of knowledge only too common in these enlightened days, and the second that, perhaps, after all, the sender had struck a happy note in that he had unconsciously referred to Japan as what it is, the Gateway of the East. And it is in response to this latter thought that this article has been written.

Now the development of the Pacific Coast, as far as pulp and paper is concerned, has only recently commenced in real earnest but it is already evident that manufacturers are looking to the Orient as an outlet for their surplus production.

In this connection Japan, being a matter of only 4,000 miles away and the nearest of the oriental countries, must command prior consideration and when her commercial activities are closely examined this fact is very apparent. Unlike China, Japan has developed enormously during the last 60 years and her pulp and paper manufactures have been among the foremost of her industries.

### A Half Century

The first mill established for the manufacture of foreign style paper was erected by the Yukosha Paper Co. in Tokyo and commenced working in 1874. This was followed the next year with the erection of a mill by the Oji Paper Co., the most influential paper company in Japan today. The annual output then amounted to 1,500 tons. The Nakanoshima Paper Mill, Osaka, the forerunner of the big mills of the Mitsubishi Paper Co. of today, followed some three years later and the industry expanded rapidly until today Japan's chief pulp and paper manufacturing companies are capitalized at over \$100,000,000 and manufacture 650,000 tons of paper and 636,000 tons of wood pulp annually. And this market is within two weeks reach of the Pacific Coast with excellent shipping opportunities and a steady demand!

Now as far as paper is concerned Japan is not a market that can be cultivated with a marked degree of success and this is due to the fact that the industry has

progressed so satisfactorily in the present century that more paper is exported than is imported. This is shown by the following figures of foreign style paper movements.

| Exports    |             |                |
|------------|-------------|----------------|
|            | Pounds      | Value          |
| 1926 ..... | 81,194,000  | Yen 15,222,000 |
| 1927 ..... | 84,939,000  | 14,853,000     |
| 1928 ..... | 133,813,000 | 18,259,000     |
| 1929 ..... | 181,410,000 | 26,149,000     |
| Imports    |             |                |
|            | Pounds      | Value          |
| 1926 ..... | 133,429,000 | Yen 20,448,000 |
| 1927 ..... | 108,956,000 | 14,632,000     |
| 1928 ..... | 100,505,000 | 14,346,000     |
| 1929 ..... | 79,205,000  | 12,510,000     |

\*Normal value of the Yen is about \$.50.

That the value of paper imported into Japan has remained about the same during the last three years is accounted for by the fact that there are certain grades and types of paper of the best quality which are consumed in such small quantities that it would not pay domestic producers to install the special machinery or processes necessary for their manufacture. In this class are the best quality bond and ledger papers which are imported from the United States and Canada and the higher grades of enameled papers, which emanate from Germany and other European countries.

The growth of the paper manufacturing industry in Japan may be traced from the production and sales figures for the last three decades:

|                       | Production<br>Unit 1,000 lbs. | Sales<br>Unit 1,000 lbs. |
|-----------------------|-------------------------------|--------------------------|
| 1902-06 Average ..... | 119,944                       | 124,025                  |
| 1907-11 Average ..... | 175,529                       | 173,728                  |
| 1912-16 Average ..... | 329,586                       | 329,089                  |
| 1917-21 Average ..... | 514,696                       | 502,047                  |
| 1922-26 Average ..... | 836,531                       | 818,046                  |
| 1926 .....            | 1,074,647                     | 1,039,408                |
| 1927 .....            | 1,151,515                     | 1,131,568                |
| 1928 .....            | 1,305,755                     | 1,292,598                |
| 1929 .....            | 1,418,187                     | 1,379,232                |

It will be noticed that production in 1929 was considerably in excess of sales but this was a temporary set back caused by the pending return of the country to the gold standard and the consequent depression of



The Yodogawa factory of the Oji Paper Manufacturing Company, Osaka

trade necessitated by the deflation of currency. The present year also will not show to good advantage as production is being curtailed in order to help the industry over the existing period of depression.

#### Wood Pulp

With regard to woodpulp a different story may be told. Japan manufactures a considerable quantity and production is increasing at the rate of 10 per cent each year but, even so, some 80,000 tons are imported annually and it is unlikely that this quantity will decrease for many years to come.

Recent statistics of pulp manufacture show the following:

|      | Kraft<br>Tons | Sulphite<br>Tons | Groundwood<br>Tons | Total<br>Tons |
|------|---------------|------------------|--------------------|---------------|
| 1926 | 6,857         | 258,682          | 234,762            | 500,301       |
| 1927 | 8,918         | 287,491          | 239,981            | 536,390       |
| 1928 | 20,306        | 310,020          | 237,203            | 567,529       |
| 1929 | 26,701        | 337,019          | 272,696            | 636,416       |

It must be admitted that large stocks of low grade pulp are being held by the mills but with a return to normal consumption these stocks will easily be consumed.

Japan's imports of woodpulp during the last few years have steadily increased.

In 1929 the pulp imports amounted to a total of 90,059 tons. Of this total Canada supplied 39,176 tons and the United States 16,294 tons.

These imports into Japan consist principally of unbleached sulphite pulp from Canada, with smaller amounts of mechanical ground wood and bleached sulphite from the Scandinavian countries. While the greater part of the pulp imported is consumed in the mills manufacturing foreign-style papers, a considerable and growing demand has arisen from the rayon mills, of which there are now 10 in operation, with capacity of 16,000,000 to 17,000,000 pounds per annum, which it is expected will be raised to 25,000,000 pounds within a

#### Origin of Imports of Wood Pulp Into Japan

| Country of origin— | 1926       |             | 1927       |             | 1928*      |             |
|--------------------|------------|-------------|------------|-------------|------------|-------------|
|                    | Short tons | Value       | Short tons | Value       | Short tons | Value       |
| Germany            | 6,347      | \$486,781   | 4,552      | \$315,501   | 1,827      | \$133,797   |
| United Kingdom     | 1,046      | 81,763      | 1,637      | 239,210     | 592        | 130,693     |
| Sweden             | 15,048     | 1,167,218   | 10,789     | 836,973     | 7,283      | 536,726     |
| Norway             | 6,104      | 551,489     | 8,559      | 855,593     | 7,805      | 704,201     |
| United States      | 4,842      | 373,568     | 3,593      | 281,320     | 7,535      | 598,517     |
| Canada             | 34,870     | 2,330,374   | 47,335     | 2,882,652   | 52,344     | 2,900,402   |
| Other countries    | 2,446      | 199,832     | 3,362      | 244,839     | 4,504      | 310,777     |
| Total              | 70,703     | \$5,191,025 | 79,827     | \$5,656,088 | 81,890     | \$5,315,113 |

#### Imports of Paper Into Japan by Countries of Origin

| Country of origin— | 1924         | 1925        | 1926        | 1927        | 1928*       |
|--------------------|--------------|-------------|-------------|-------------|-------------|
|                    |              |             |             |             |             |
| United Kingdom     | \$2,530,302  | \$1,628,056 | \$1,896,109 | \$1,532,290 | \$1,680,567 |
| Germany            | 2,605,769    | 1,277,575   | 1,652,970   | 1,235,978   | 1,249,341   |
| Sweden             | 3,114,375    | 1,845,569   | 3,127,354   | 2,403,685   | 1,879,344   |
| Norway             | 527,232      | 519,156     | 527,273     | 570,817     | 463,788     |
| United States      | 1,251,764    | 688,241     | 1,177,529   | 821,142     | 724,294     |
| Other countries    | 1,486,458    | 1,222,171   | 1,544,593   | 992,290     | 1,004,985   |
| Total              | \$11,515,900 | \$7,180,768 | \$9,925,828 | \$7,556,202 | \$7,002,319 |

Source—U. S. Dept. of Commerce.

\*Preliminary figures; subject to revision.



The Karafuto Kogyo Paper Mill at Tomari

year or so. These mills consume in the neighborhood of 10,000 to 15,000 tons yearly of the best-grade bleached sulphite pulp, which the Japanese mills do not produce at the present time. Imports of pulp for paper making into Japan by countries of origin appear in the accompanying table.

The position of rayon pulp will bear serious consideration on the part of Pacific Coast producers. Japan is continually expanding in the rayon industry and new mills are still being erected. It is essential, however, for manufacturers to turn out a high grade of pulp and if exports to Japan are seriously contemplated it will be necessary for qualified engineers to be sent to demonstrate the qualities of the pulp. This may sound dogmatic but the reason for it lies in the fact that the Japanese rayon mills have practically all been erected under the supervision of European engineers and with European processes and the trend has been to confine the use of rayon pulps to those grades being successfully used in Europe.

#### Rayon Important

Of the 80,000 tons of pulp imported during 1929 some 13,000 tons were consumed in the manufacture of rayon and as this industry is rapidly expanding and the quality of Japanese raw material is unsuitable for making into rayon pulp it is inevitable that imports must continue to increase in the future.

And consider another fact. The annual consumption of paper per capita in Japan is 20 lbs. Contrast this with the 200 lbs. per head consumed in the U. S. A.! What is more likely than that the continued growth and development of the country will lead to a vast increase in the consumption of paper? Even assuming that the consumption reaches only 60 lbs. per capita, just imagine the enormous quantity of wood pulp that will be required! Apart from this must be considered Japan's exports of paper which altho amounting only to \$13,000,000 per annum now must expand each year and must call for a corresponding increase in the quantity of wood pulp required for manufacture.

Japanese raw material for wood pulp manufacture is composed chiefly of various grades of pine. The majority of the requirements were, until two years ago, drawn from the northern island, Hokkaido, but owing to ruthless cutting supplies are becoming scarcer and it is estimated that lumber in this district will last only for 20 years. The local government has recognized this fact and has now restricted the annual supplies in Hokkaido to 25,000,000 cubic feet.

The main source of supplies is now found in the southern half of the island of Saghalien or Karafuto as it is called by the Japanese. Immense forests are available in this district but labor is not too plentiful and production costs are correspondingly high while the lack of adequate protection leads to enormous losses by fire each year.

The timber resources in this territory were at one time thought to be abundant for the future needs of Japan as they were estimated at seven billion cubic feet. Since 1919, however, the pine lappet has caused considerable damages and during the two following years over 44,100 acres of forest land were ruined by this pest. Emergency protection measures were undertaken by the Saghalien government and some lands which could not adequately be cared for by that agency were sold to private interests with the understanding that they would safeguard the trees. Due to this pest a large amount of timber was cut, rising from 2,400,000 koku in 1921 to 6,600,000 koku in 1922, 9,540,000 in 1923, 9,470,000 koku in 1924, 10,800,000 koku in 1925 and 11,480,000 koku in 1927. A koku is roughly ten cubic feet.

Divided according to species the domestic output of timber in order of importance is cryptomeria, pine, cypress and fir. The main island produces about 25 million koku of timber a year, Hokkaido 12 million koku for lumber and 14 million koku for fuel purposes. An increase by any great extent over this amount is dependent upon the development of transportation as well as government cutting regulations.

Altho large timber supplies are available the quantity

(Turn to page 121)





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# T·A·P·P·I—

## Accomplishments of the Pacific Section in the Year 1929

**S**PURRED by a desire to meet occasionally and talk over problems of the industry, yet faced with a geographical handicap that practically forbids attendance at the regular meetings of the national body, the technical men of the pulp and paper industry associated with the mills on the Pacific Coast formulated during the year 1929 a regional organization known as the Pacific Section of TAPPI. The Pacific Coast division is part and parcel of the national organization, formed purely for the convenience of the Western men so as to permit them to get together. All TAPPI members residing on the Pacific Coast of America are automatically members of the Pacific Section.

The idea had its seed in a pulp and paper conference held at the University of Washington in October, 1928. At this informal and well attended meeting it was resolved to put the machinery in motion to organize a Pacific Section of TAPPI. H. K. Benson of the University of Washington was requested to act as secretary and accordingly issued invitations to all Pacific Coast mills to send representatives to a meeting in Seattle on January 12, 1929.

The January meeting was purely executive in character. As an official preliminary organization committee it drew up some resolutions, the substance of which was a formal request to national TAPPI for permission to organize a Pacific Section, and to have some certain latitudes in membership.

### Approved

When TAPPI held its annual meeting in New York February 19-21, 1929, the Pacific Section suggestion was met with general favor. As a note of special consideration for the West, Robert Bell-Irving, mill manager of Powell River Co., Ltd., was elected to the national executive committee of TAPPI to represent all Pacific Coast interests. At the same time the national committeemen decided to give the Coast its full support and moved to send the association secretary, R. G. Macdonald, to visit the Pacific Coast in the summer and assist in the sectional organization.

Secretary Macdonald came West in June, his first trip to the Pacific Coast, and visited a majority of the mills and made the acquaintance of many executives and operating men. In Macdonald's honor a formal dinner meeting was held in Seattle on June 22, at which time the secretary outlined the aims and functions of the TAPPI organization.

The net result of the June meeting was the election of a first set of officers and a decision to hold a fall meeting with regular program in Tacoma, Washington. These first officers were: Chairman, C. R. P. Cash, Cascade Paper Co., Tacoma; Vice-Chairman, R. M. DeCew, Fibreboard Products Inc., Sumner; Secretary, H. K. Benson, University of Washington, Seattle; Membership Chairman, A. H. Hooker, Jr., Hooker Electrochemical Co., Tacoma.

The first fall meeting was held in Tacoma on October 5, 1929, with the gracious cooperation of the Hotel Winthrop and the Tacoma city fathers and industrial leaders. For a first meeting the attendance was both excellent and representative. A well rounded out program was offered and the meeting concluded with a spirit of good fellowship reigning in a well-filled banquet room at the Hotel Winthrop.

R. S. WERTHEIMER

Chairman

PACIFIC SECTION

T.A.P.P.I.



Election of a permanent set of officers to guide the destinies of the Pacific Section for the ensuing year was the principal business of the fall meeting. Robert S. Wertheimer, resident manager of the Longview Fibre Co., Longview, Washington, was unanimously elected chairman; Ralph Reid, head chemist of the St. Helens Pulp & Paper Co., St. Helens, Oregon, was elected Vice-Chairman, and H. K. Benson was retained as secretary.

Motion made to hold a spring meeting at Longview.

P. H. Glatfelter, president of the TAPPI national body, was the honor guest at the Tacoma meeting. In his address he outlined the principal functions of TAPPI. He urged, in the recruiting of new members, that efforts be not confined to the chemists, but that special efforts be made to include the mechanical men, steam and power plant engineers, and other key men.

President Glatfelter expressed a high praise for the initiative of the Pacific Coast men, for the program they had outlined, and for the excellent attendance.

After the fall meeting the following appointments were made on the program and publicity committee: A. H. Hooker, Hooker Electrochemical Co.; L. R. Wood, Union Bag & Paper Power Corp., Tacoma; Ralph Reid, St. Helens Pulp & Paper Co.; and I. H. Andrews, Powell River Co., Ltd., Powell River, B. C.

The following membership committee was named:

(Turn to page 132)



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3814



# Some Trends In Converted Paper Products

## A Discussion Proceeding from the General to the Specific

By L. J. ARMS, Western Sales Manager  
National Paper Products Co., Division of Crown Zellerbach Corporation

IN the early days came a time when man began to tire of stone tablets and chisels and began to cast about for some more convenient means by which his thoughts might be set down with accuracy for preservation or transportation. We are familiar with the progress made down through time with papyrus, skin parchments, rag papers, down to the present day of high grade wood pulp papers on fast machines of big tonnage.

Paper products are roughly divided into two major groups, the cultural and the mechanical. First developments were along cultural lines. It was perhaps not until man learned to make paper on a real mass production basis, and to make it cheaply, that inventive minds began to cast about for other uses for paper than the cultural. Most of this development comes within the scope of the past century, with unquestionably the greatest progress having been recorded in the last 25 to 30 years.

Probably there was a double urge to expand the field of paper along mechanical lines. On the one side, the practical folks were discovering here and there an increasing number of uses for paper. On the other hand, the manufacturers, with manufacturing methods improved, and greater and greater tonnage on their hands, tried delving into new fields for paper to conquer that they might market this increasing tonnage.

### A New Trend

Here began a new trend. New uses of paper were heretofore developed thru putting to new practical purposes an existing grade of paper. When the mill operators visioned the opportunities in these new uses, they began to provide papers manufactured for specific uses. For the manufacturer there was the further urge to create for himself an additional profit thru converting the paper as it came from the paper machine into a product one step more refined, by benefit of another process in manufacturing.

In recent years we have seen the paper converting field blossom into an unending variety of products. Even to begin to catalog these many products is out of the question, but it will be helpful for the present purpose to discuss one or two specific groups within this field in order to indicate trends. Let us take, for example, sanitary products and food containers, two lines which I am perhaps best fitted to discuss by reason of long contact with them.

The field of sanitary products has grown to considerable proportions within itself. It has in the past half century witnessed a steady refinement of product and a great increase in variety and uses. In this group are such items as toilet papers, paper towels, tissues for removing facial cream, and a host of other items.

Perhaps the first roll of toilet paper was marketed about 50 years ago. About 25 years ago folded toilet paper began to appear on the market. The evolution referred to in preceding paragraphs can be traced in

this product. Manufacturers came to recognize that a distinct market for a special use of paper could be developed here and that people were willing to pay for better grades, for better means of dispensing. Today, we find special grades of this product marketed under brand name and supported by national advertising, a particular technique developed in manufacture, a technique which no doubt even yet is undergoing further refinements toward the better meeting of definite requirements.

In the field of paper towels, it may be that the product of today has descended from the time-worn practice among paper mill employes of using paper machine broke for temporary towel use. Someone perhaps got the idea then, of rolling up a bunch of trim and hanging it on the wall until the product reached the stage of marketing, and salesmen went out some 25 years ago and began to convince the public of the practicality and utility of the roll paper towels. There followed improvements as the new product found consumer acceptance. Manufacturers listened to complaints on the original product and straight way directed their manufactures toward a special purpose—towels—and developed papers which had desirable qualities of absorbency, softness, resiliency, until today the paper towel is without doubt far removed in quality from the product first put on the market a quarter of a century ago.

With the growing acceptance of the paper towel, came demands for improved methods of dispensing, and quite a flourishing dispensing cabinet business grew up to meet the new demands. About 1911, some inventive minds in San Francisco developed the interfolded towel and solved a big problem in dispensing by putting some kind of control on the user. Then, about two years later, the National Paper Products Co. really came into being thru the acquisition of the interfolding patents. Their widely distributed Public Service towels date from this time.

In the past year, one of the most significant developments in sanitary papers has been placed upon the market. It is the self-disposing toilet seat cover, developed on the Pacific Coast and now being manufactured in Portland by the National Paper Products Co., a Crown-Zellerbach subsidiary, and distributed thru the Zetex Corporation, as selling agents to the jobbing trade.

### Many Patents

This homely article is not new in point of thought, as the many applications on record in the U. S. patent office will testify, but no perfected article, incorporating the necessary self-disposing feature was brought forth until during the past year. Here again, is a case of turning makeshifts into a marketable article for which there has been a long felt need, particularly in public buildings.

Even in the limited time that these toilet seat covers have been on the market, a ready acceptance has been



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apparent. And the article has added a new tonnage to the industry and provided more employment in the fields of paper converting and auxiliary equipment manufacture.

Turning now to the field of containers, particularly food containers, a definite evolution can be traced as well. We need not look back very far to recall the times when we went to the corner drug store with a tin pail to buy our ice cream. Then came the nesting paper container with string or wire handle which the druggist packed by hand from the freezer. Now, the packing has moved on into the ice cream factory where all is done by machine, more accurately, with less expense and labor. And the retailer can attend to his main job, which is selling, and not packing cartons.

From ice cream and dairy products, the container has moved into a lot of new territory in the packaging of liquid and semi-liquid foods. Aside from the nesting type of cartons or pails, there has been developed more rigid, straight-sided articles on the order of the Purity Paper Bottles, which are a decided advantage to both retailer and consumer.

#### Food Containers

Some other advances in this department of food containers may be mentioned in the increased use of paper containers for such articles of food as jelly, honey, marmalade, mincemeat, candy, coffee, marshmallow cream. And perhaps one of the most important developments here is the creation of a container for peanut butter which, during the past year, has come to be extensively used by a Pacific Coast manufacturer. Peanut butter, because of the oil's penetrating qualities, has been a most difficult product to package, and when it is considered that the new Tulip Nestrite paper container will resist the oil penetration for about three weeks the importance of the advance is appreciated.

In this same line is the research done to perfect a drinking cup suitable for hot liquids. This has now been accomplished and opens new fields for paper tonnage.

Paper containers are also exploiting the other end of the thermometer and are now being used extensively for the packaging of frozen food products, notable among which are frozen berries, which make available to the housewife in winter, fruit whose freshness is comparable to that on the market in the summertime.

All these advances, these extensions of the use of paper, have gone through their period of evolution, have progressed from general to specific uses.

To the paper industry as a whole, these increasing uses for paper have meant widening demands for tonnage, and for tonnage produced on more and more exacting specifications. They have served to build up a large business complementary to paper manufacturing itself, a business that takes the "raw" paper from the jumbo roll and puts it through further manufacturing processes—converting—and brings one more opportunity for profit.

Individual conditions more or less govern where the converting is to be done. In some cases, particularly on those products where there is considerable trim that can be diverted back to the beater, it is found to be more advantageous to have the converting plant integral with the paper mill. On the other hand, freight rates, labor market, and other conditions, particularly for some converted paper products, serve to make the converting

equally, or even more, profitable if located away from the mill.

#### A BRIEF SUMMARY OF SCANDINAVIAN PAPER AND PULP PRODUCTION, 1913-1930

The following table illustrates the development of Scandinavian Paper and Pulp industry. Denmark is not included as it manufactures almost entirely for home consumption.

Production in 1913 and 1925 as well as estimated production for 1930, follows, in metric tons:

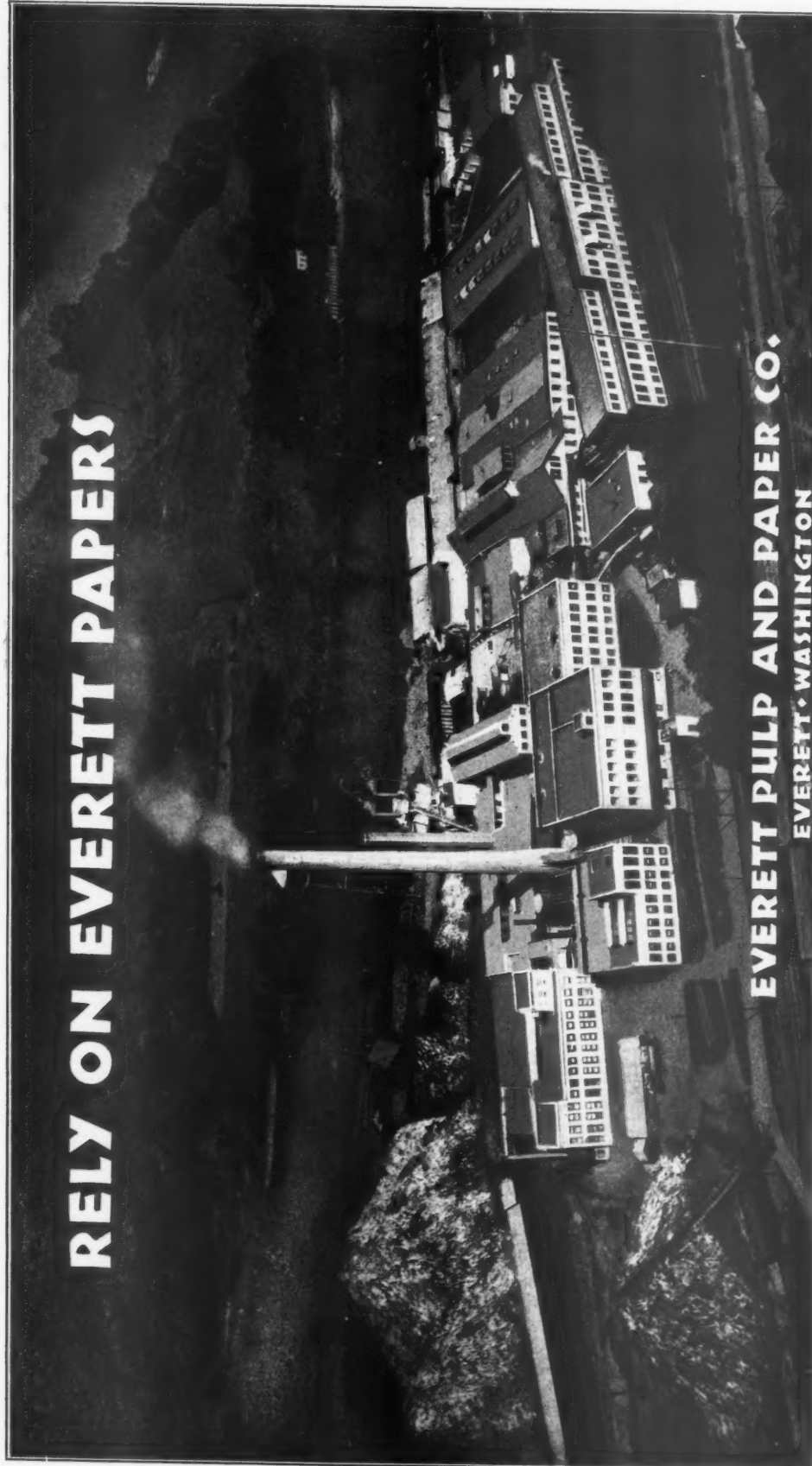
| Paper                | Sweden    | Norway  | Finland | Total     |
|----------------------|-----------|---------|---------|-----------|
| 1913                 | 284,000   | 209,000 | 168,000 | 661,000   |
| 1925                 | 485,000   | 327,000 | 259,000 | 1,071,000 |
| 1930                 | 720,000   | 418,000 | 342,000 | 1,480,000 |
| Cardboard and Carton |           |         |         |           |
| 1913                 | 49,000    | 11,000  | 58,000  | 118,000   |
| 1925                 | 72,000    | 18,000  | 56,000  | 146,000   |
| 1930                 | 114,000   | 27,000  | 104,000 | 245,000   |
| Sulphite             |           |         |         |           |
| 1913                 | 705,000   | 254,000 | 66,000  | 1,025,000 |
| 1925                 | 962,000   | 315,000 | 303,000 | 1,580,000 |
| 1930                 | 1,240,000 | 384,000 | 589,000 | 2,213,000 |
| Sulphate             |           |         |         |           |
| 1913                 | 155,000   | 50,000  | 63,000  | 268,000   |
| 1925                 | 332,000   | 57,000  | 64,000  | 453,000   |
| 1930                 | 745,000   | 71,000  | 194,000 | 1,010,000 |
| Ground Wood          |           |         |         |           |
| 1913                 | 325,000   | 365,000 | 155,000 | 845,000   |
| 1925                 | 440,000   | 440,000 | 275,000 | 1,155,000 |
| 1930                 | 780,000   | 650,000 | 500,000 | 1,930,000 |

The tonnage of Sulphite, Sulphate and Ground Wood is figured at 100 per cent air-dry.

The total production of Paper, Cardboard and Pulp in 1913 was therefore 2,918,000 tons compared with 6,880,000 tons in 1930, an increase in 17 years of about 130 per cent. In the same period the production capacity of Sweden has increased 137 per cent, that of Norway about 70 per cent, and that of Finland about 240 per cent.—Papier-Zeitung, December 25, 1929.



U. S. PAPER PRODUCTION—1929  
Distribution of the Principle Grades—% of the Whole  
Based on American Paper and Pulp Association Data



**PIONEER PACIFIC COAST MANUFACTURERS OF**

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PACIFIC PAPER TRADE ASSOCIATION OFFICERS—1929

Left to right: Frank L. Lange, vice-president; Mason B. Olmstead, vice-president; Charles Pritchard, executive vice-president; W. D. McWaters, president; Carl H. Fricke, vice-president; Charles Kahn, secretary.

# THE PAPER TRADE

## Summing up the bouquets and bruises of 1929

**C**ONDUCTING a paper jobbing business in these Pacific Coast states was not exactly a bed of roses in this past year 1929. It was a case of figuring closely, keeping the salesmen ever at it, of meeting a lot of small orders, of giving a lot of extra service and keeping an eye on the credit situation. It was a good, hard battle, but outside of being a bit winded, there seem to have been few or no casualties.

A digest of opinion from the leading Coast jobbers brings out some pertinent facts. There is general agreement that pressure of competition is growing steadily greater. During the year this pressure sought relief occasionally in price cutting. In paper bags this seems particularly to have been true, and paper bag manufacturers seem to agree that the converting offers no profit, but simply affords an avenue for disposing of so much tonnage.

The other outlet for competition pressure seems to have evidenced itself in expanding service. Elaborate service departments are being built up by some jobbers to answer printers' problems and the like, until some have expressed a real fear that these service departments are becoming top heavy. Further, the wider that service of this kind is expanded, the more need is there for the highest grade technical personnel to direct it, a calibre of skill not always easy to find. And without real competent experts in the service departments, the efforts are nullified.

### Direct Sales

Some jobbers report an increased tendency on the part of customers to go directly to the mills for their paper, particularly for carload orders. On the other hand, the big customers advance the argument that they are big enough to buy around and not through the jobber. Some jobbers inwardly recognize this trend toward direct sales on the big business, but others are sincerely fighting all such tendencies with greatest vigor.

In these days of competition, when everyone is trying to cut corners there is much temptation on the part of the mills to court the direct sale to get tonnage. There is the same urge on the part of the big consumer to shade his costs to the utmost. Most of the business has continued to move through the regular jobbing

channels so far, however. In this connection the Coast jobbers have had an additional problem to meet in that the Eastern mills, disposed to maintain their home markets in stability, have now and then resorted to dumping peak tonnage on the Coast, to no good end for the Coast jobber.

Another point on this matter of direct mill sales is the uncertainty of forecasting the future in these days of rapid business changes. If a paper mill gives a flat "NO" to a small organization seeking direct purchases today, the mill may lose a most desirable account when the small fry grows into a powerful chain tomorrow. And examples of exactly such things happening can be drawn from life, not theory.

The smaller customer who cannot hope to make direct mill purchases has endeavored to keep his stocks on the jobbers' shelves. Such procedure has brought no benefit to the jobber, but has necessitated the giving of speedier delivery service—or perhaps it is that speedier delivery service of today has made it unnecessary for the customer to keep on hand even modest stocks. In any event, jobbers now generally recognize that the very small order is not only poor pay, but less than no pay at all, and some honest effort to eliminate these small orders is being made.

### Gingerly Stepping

The well known stock market debacle last fall deadened the nerves of business in general, not excluding the paper business. But sufficient time has now elapsed in which to note any permanent injury, and there seems to be none. Most jobbers a month or two after the crash emphatically denied that they had noticed any change of business, but some denials were so emphatic as to have the appearance of "whistling in the dark." Credit managers kept an eagle eye on affairs and strode gingerly down the middle of the fence for the first couple months after the crash, but nothing happening, they moved on again with more confident stride.

Claims of over-production of paper on the Coast once more were shouted. Admittedly, the Coast population is not increasing in keeping with the paper production. The Coast market being at the mills' doors, has tempt-

(Turn to page 130)



# PACIFIC COAST SUPPLY COMPANY



*Representing the Foremost Manufacturers of Supplies*

**F. C. HUYCK & SONS**

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**EASTWOOD WIRE CORPORATION**

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**TEXAS GULF SULPHUR COMPANY**

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**CALIFORNIA COTTON MILLS CO.**

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**WALKER CUT STONE CO.**

*Pulp Stones*

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As time hurries on the

# PAPER BOX MAKERS

find that their

## Customers are growing up

The paper box makers find that their customers have grown up, that they now order by carloads where once they ordered by dozens. And the box makers have had to adjust themselves with the changing times. What some of these adjustments were in 1929 and what further changes are ahead is reviewed here, based on the opinions of a number of the industry's leaders.

**F**OLLOWING in the path of the tin container, the glass container, and the paper container industries, from small individual enterprises catering to small clients, the paper box industry has now reached that higher stage of development, already reached by the other container industries—huge consolidations serving gigantic industries.

Overnight almost, the paper box industry has found that its clients have become titans—that the little dairies that bought 10,000 cartons per year have merged to become such a consolidation as Golden State Milk Products Co., which buys millions of cartons yearly. The big department stores that formerly were staggered at the idea of an order as big as 5000 lbs. of paper boxes think nothing of an order of 200 tons. The same is true of the raisin industry. The breakfast cereal manufacturers, who formerly ordered 10,000 cartons, now order by car loads, and the cracker and biscuit manufacturers do likewise. One bakery alone, in San Francisco, which used to use only 10,000 cake boxes per year, now demands 250,000 for only one store. So it goes with all manufacturers using paper boxes.

The paper box business once was good for the small man; today his path is less rosy. All his customers have grown so big that the little man has less chance to supply them. Big industrialists are sometimes afraid to entrust an order of magnitude to a small manufacturer, for in the event of the little box factory going out of business or having a break down, the order would not be completed.

This then, is the situation of the paper box manu-

facturers on the Pacific Coast, they must grow with their customers or go under.

Speaking of mergers in the paper box industry, R. J. Gruenberg, director of Consolidated Paper Box Co., San Francisco, says, "Mergers must not be judged of their success immediately after they are consummated.



Charles Ruble (left) and R. O. Comstock, president and secretary respectively of the Pacific Coast Paper Box Makers Assn.

All mergers find the first year or so difficult. Cash must be conserved for operating expenses; sometimes dividends must be conserved toward this end. But eventually it will be found that the merged units are operating at a great savings."

Concurring in this opinion is Samuel Platt, president and general manager of the United Paper Box Co., San Francisco, who says, "The 1929 merger which formed the United Paper Box Co. has been highly successful. But in order that a merger be beneficial to the industry as a whole, a merger must first be beneficial to the business itself."

(Turn to page 123)

## BOXBOARD PRODUCTION—1928-1929

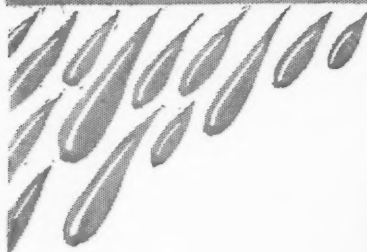
Reports of the U. S. Department of Commerce show that the production of boxboard was 80.3 per cent of capacity in 1929 as compared with 78.9 per cent in 1928

—a significant increase in view of the fact that the total capacity was greater in 1929 than it was the previous year.

| Year— | —Operation—<br>Inch hours |             | Per Cent<br>of<br>Capacity | —Production—<br>Short tons |           | Per Cent<br>of<br>Capacity | New<br>orders<br>Short tons |
|-------|---------------------------|-------------|----------------------------|----------------------------|-----------|----------------------------|-----------------------------|
|       | Capacity                  | Operated    |                            | Capacity                   | Output    |                            |                             |
| 1928  | 128,628,580               | 101,536,731 | 78.9                       | 3,401,974                  | 2,682,645 | 78.9                       | 2,697,947                   |
| 1929  | 134,812,296               | 107,973,125 | 80.3                       | 3,628,126                  | 2,912,903 | 80.3                       | 2,854,072                   |

| Year— | Shipment<br>of<br>Box Board | Capacity  | —Consumption of Waste Paper—<br>Short Tons Consumed |  | Per Cent of<br>Capacity |
|-------|-----------------------------|-----------|---|--|-------------------------|
|       |                             |           |   |  |                         |
| 1928  | 2,669,907                   | 3,182,330 | 2,512,059   |  | 78.9                    |
| 1929  | 2,903,854                   | 3,512,782 | 2,774,953   |  | 79.0                    |

# The NEW KENWOOD TANNED NEWS FELT IS A PROVED ECONOMY



It has fully demonstrated its worth and justified the progressive, scientific development that made it possible.

In openness, strength and finish, this new Kenwood News Felt is outstanding. To these advantages are added the benefits of the patented Kenwood Tanning processes which protect the felt from the effects of acids, alkalies and water and enhance the natural resiliency of the wool.

Kenwood pioneered the one-sided board felt—Kenwood developed and perfected the Kenwood Tanning Processes. In the new Kenwood News Felts a further major development to the economy of papermaking is brought forth.

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# KENWOOD FELTS

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Brubaker Aerial Surveys, Portland

**EMPIRE, OREGON**

With the completion of this 50-ton unbleached sulphite pulp mill by the Sitka Spruce Pulp & Paper Co. during 1929, a new pulp timber region, the Oregon Coast, has been opened up. This aerial view was taken shortly before construction was completed.





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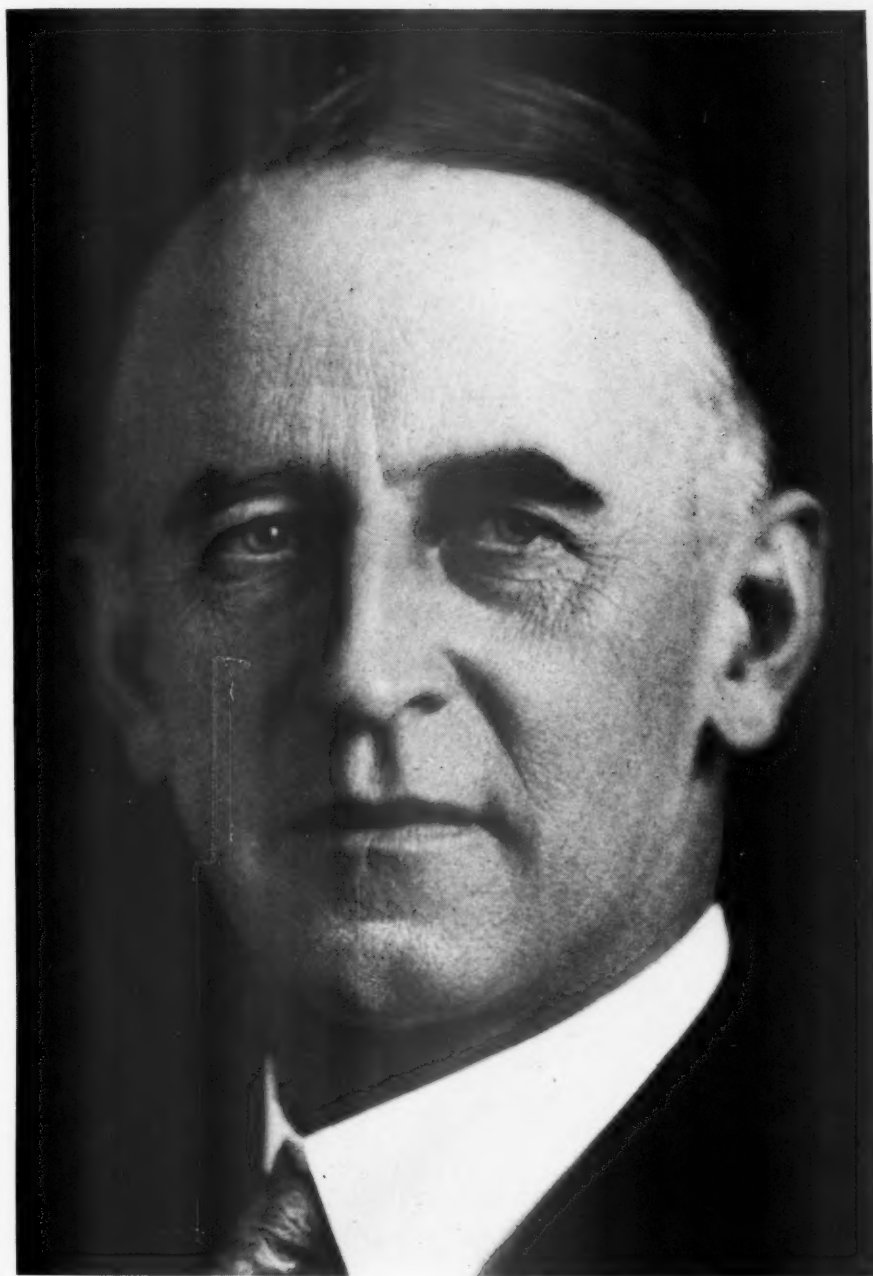
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**PORTLAND, OREGON, U. S. A.**

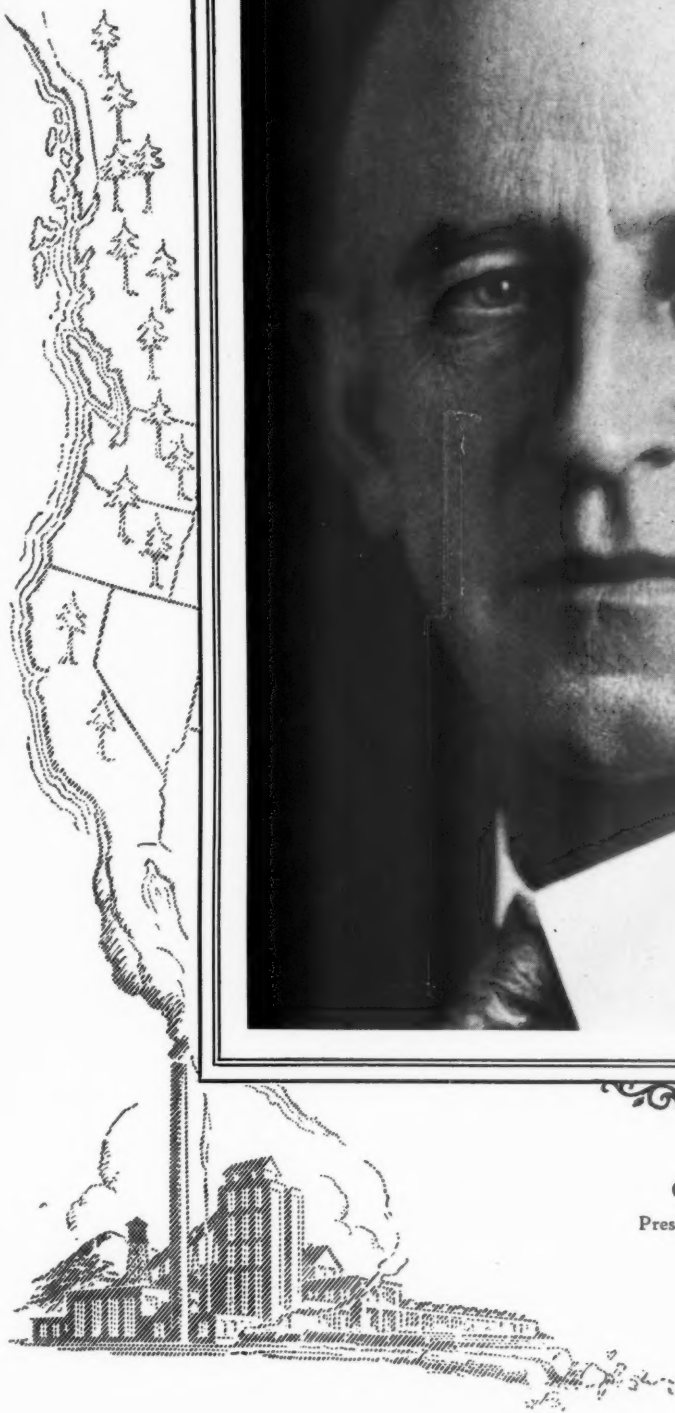
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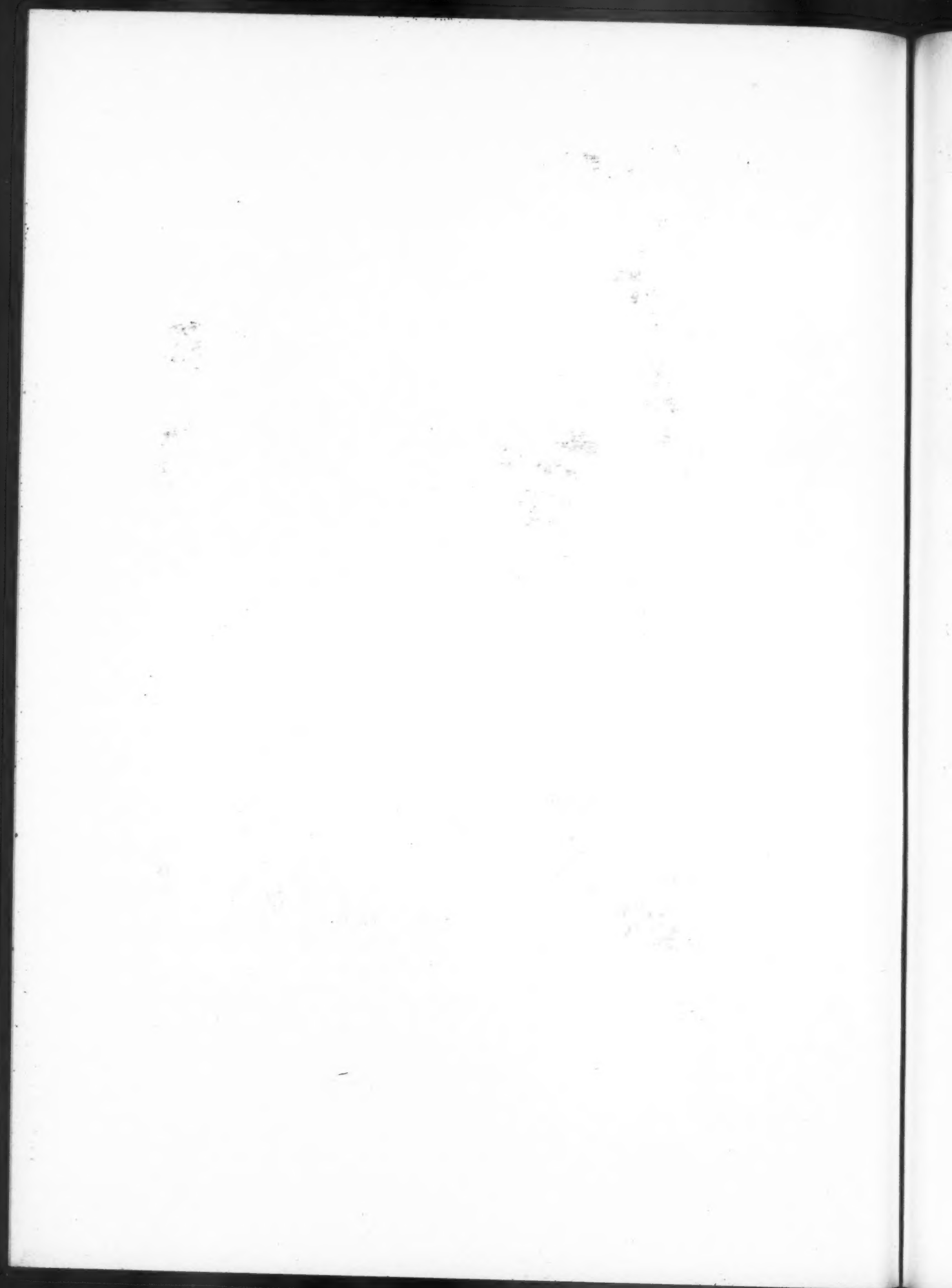
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Supplement to Pacific Pulp & Paper Industry

**OTTO W. MIELKE**  
President, Blake, Moffitt & Towne





## Yesterday's Paper Machines

must remove the

# Handicap of Obsolescence

The rapid development of the technique of paper manufacturing is causing a wholesale rebuilding and modernizing of production equipment. . . .



GR<sup>EAT</sup> advances in the technique of paper manufacturing in recent years have been coincidental with improvements in the technique of paper machine building. This very extensive advancement in the paper making field is giving the mills equipped with old machines lacking modern improvements cause for great anxiety. In other words,

these new developments have tended to make the old machines obsolete long before they would naturally be expected to wear out and has made them unable to compete with newer machines unless their handicap of obsolescence be removed.

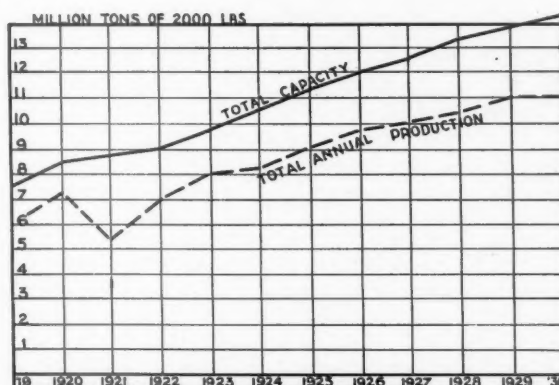
A large part of the business of the paper machine builders in recent years has been given to the work of reconditioning and modernizing the older machines, and there is strong evidence that much machine shop capacity, at least in the next few years, will be set aside for the rebuilding of old paper machines. The cry of the paper manufacturers has been for greater tonnage and better quality. The sharpening of competition with the general increase in the volume of paper production in the country has served to focus the most intense study on the part of mill owners, managers and engineers on the problem of cutting down unit costs and of getting greater returns from their equipment.

This article represents the boiled down opinions of the leading paper machine builders of the continent. In view of the general unrest in the paper industry, paper machines being rapidly improved, grades being shifted, the machine builders have had to devote much of their shop space to rebuilding work. We asked the machine builders for their thoughts on this tendency to recondition old machines. The replies were most interesting and in some cases exhaustive. Since a few writers preferred not to be quoted, the cloak of anonymity has been used to cover all. But sincerity never suffers under such procedure.

At the same time the general engineering profession has made great strides and many new developments first perfected in other industries have been borrowed by the paper machine builders. Improvements have been made on the wet end, in the dryer section, in the winders, on the drives and every part of the machine. Widths and speeds have been increased. Anti-friction bearings have been applied. And all these major changes have come about in the space of a very few years, making it necessary in most cases practically to rebuild today machines installed only a few years ago as the "last word".

The handicap of obsolescence is no doubt a serious matter in a great many mills. Some of these older mills have been able to develop a special product, and with slight changes on their machines are producing profitably. Both on Fourdrinier machines and on cylinder machines, there is a strong tendency to replace certain old parts with new. These changes naturally depend on the general condition of the mill properties which include handling facilities, stock preparation and the economic factors, such as transportation, water supply, wood costs, etc.

The speed at which most papers are made today has increased and with this increase in speed naturally comes the necessity of having machinery mechanically well designed and built. There are many improvements which have been made in the last number of years, which improvements have been made to increase the quantity and improve the quality, at the same time make a safe running machine, a machine easy to operate, to change wires and felts, and other ways of keeping maintenance down to a minimum.



CAPACITY OF UNITED STATES PAPER INDUSTRY  
WITH RELATION TO ACTUAL PRODUCTION  
Data from American Paper & Pulp Association

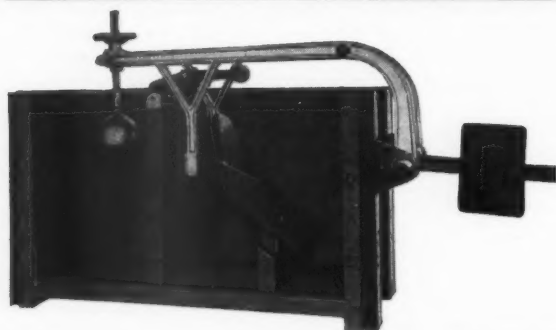
The changes in the development of the paper machines are taking place rapidly. Advantages of the Minton vacuum dryer as well as the possibilities of the Millsbaugh wet end, give some indication of what we may expect in the future. It is a certainty that future machines will run faster and in all probability will increase in width. Knowing these things, the paper machinery builder has no alternative but to plan for the future to the limit of his resources.

It was always believed that fine paper could not be made at high speeds. Both the mills and the engineers accepted this. It is now found that some very



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The Last Word in Paper Weight Control



### The No. 3 Automatic STOCK REGULATOR (FEENEY PATENT)

... in these days of increasing competition  
... of more exacting paper-trade ... de-  
manding better quality ... more uniform  
weight ... days of lessening sales margins  
... a mill is put squarely on its toes. The  
plain moral is you cannot let up and  
keep up.

**G**uaranteed to deliver uniform weight paper regardless of grade, consistency or speed of stock

Readily adjustable to capacity or weight desired

No springs, No float interference

100 per cent accessible for cleaning

Extra heavy ball bearings throughout

Inexpensive to install

Your present piping will do

Eliminates off weight

Eliminates splicing

Reduces cost » Adds profit

Installed on 60 Days Trial

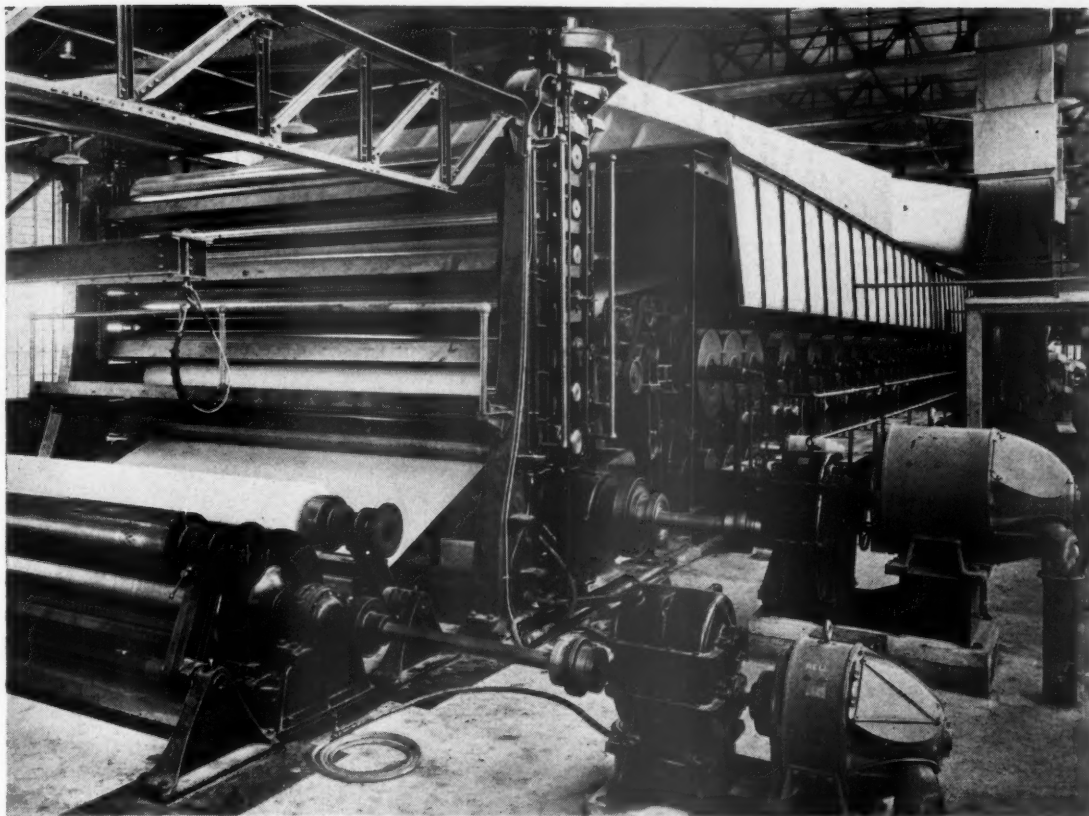
# The Baker Corporation

SINCE 1881

Saratoga Springs, N. Y.

— Where Quality Is Institutional —

When writing BAKER MANUFACTURING Co., please mention PACIFIC PULP AND PAPER INDUSTRY



The modern paper machine incorporates many refinements from fourdrinier to winder

fine paper can be made at high speed, providing the pitch of the wire and the number of strokes per minute are regulated to suit the high speed.

An interesting example of what can be done in the rebuilding of a machine is found in a Midwest mill, where a tissue machine of about 200 inches in width has been rebuilt and is now operating at 1000 feet per minute. Even so, the operators expect to attain a speed of 1200 feet per minute before they are satisfied. Improvements in this case included rebuilding of the wet end to permit formation of the sheet at high speed, installation of modern chain drives, provision of a nearly automatic reel, and improvements in the winder. The net of these improvements means that for ordinary tissue work the small machines will not be able to compete and therefore the future in the tissue business may be very much different from what it is now. This condition is particularly true with tissue paper because so many of the tissue machines are makeshift, machines that have passed their usefulness for fine papers and have been turned as a last resort to tissue production.

One of the most popular of recent developments has been in the advantages offered by a new type of mechanical drive. In many instances the old crude drive causes losses in production from vibration or interruption or unsafe running conditions at the speed desired. Quite often a new modernized drive installation is paid for in increased production many times over in the first year.

Nearly all old paper machines are deficient on the drive side. Development of the spiral bevel gear drive

in recent years has meant a great many installations because of its adaptability to all types of machines operating at any speed. The spiral drive has convinced many that it is as practical and foolproof as any for paper mill work. The electrical, sectionalized drive has made enormous strides toward perfection.

The demand for better formation at higher speeds has resulted in a number of new wet end installations on all types of machines. These new installations are roller bearing equipped throughout and, mechanically, operate with less power and lower clothing costs.

A great many improvements have been brought out recently in connection with Fourdrinier machines. Perhaps we never fully appreciate how crudely we do some things until a better method has been devised. The removable Fourdrinier with its advantage in eliminating production losses and extra labor gangs during wire changing processes, the high speed shake, oscillating suction boxes, automatic devices all through the wet end, supporting of all the wet end rolls in fine anti-friction bearings, these are but a few of the improvements on the wet end. Each modernized old machine becomes a more economical producer and adds just one more reason for the operator of an obsolete machine to modernize his own mill.

Modernization of the wet end has brought a great demand for increased drying capacity on old machines. There have been many installations of vertical dryers because of the general efficiency of this type and the possibility of installing a greater number of cylinders in limited space. Still other features are improvements

(Turn to page 129)



STRONG  
*and*  
EASY BLEACHING  
SULPHITE PULP

**55 Tons  
Daily Production**

SHAFFER BOX COMPANY  
TACOMA, WASHINGTON

When writing SHAFFER BOX COMPANY, please mention PACIFIC PULP AND PAPER INDUSTRY

### Japan

(Continued from page 103)

suitable for the manufacture of woodpulp is not so great and unless the government tackles the problem of re-afforestation in real earnest the time will come when Japan will be seriously dependent on supplies from abroad.

And now must be considered Japan's geographical position. Situated as it is only a few hundred miles from China, within easy reach of the South Seas, Hong-Kong and the Federated Malay States it is apparent to everyone that its future is unlimited.



A Street Scene in Shanghai, China

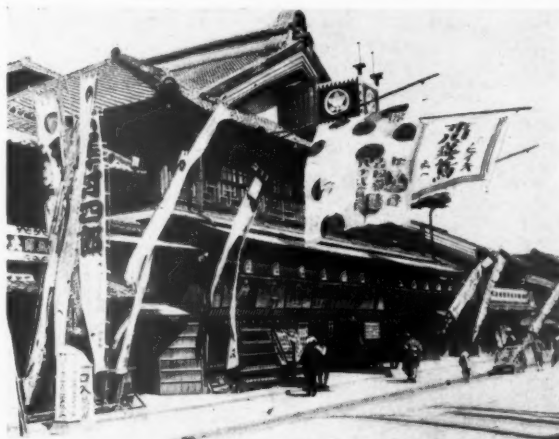
Take, for instance, China with its uncounted population of millions. Business in China has hitherto been conducted at the treaty ports and those towns within easy reach of its gigantic rivers. China has been in a turmoil of revolution and counter revolution for years

but signs are now apparent that order is emerging out of chaos and whether the process of restoring economic stability takes 20, 30 or 50 years it is inevitable that rapid progress will be made and one of the first industries to benefit by the march of progress will be that of paper. What other country than Japan is so ideally situated in this respect?

Hitherto Japan has had difficulty in meeting its own requirements but during the past few years the tables have turned and Japan must now look to its export markets to take up surplus production. Being within two days reach of China what other country can hope to compete with it economically? The future is unlimited and while unprecedented progress cannot be expected in China within the next ten years the normal increase of trade with Japan leaves room for a considerable expansion of paper sales.

In spite of the difficulties Japan has had to contend with since the European war due to the high cost of living and the unsatisfactory state of the country's finances the exports of paper have increased and in the last four years the sales made outside Japan have gone up by 50 per cent, and some \$13,000,000 worth of paper now leaves the country each year. Of this amount 86 per cent goes to China, and the Kwantung province, and the surface of these markets has only just been scratched!

It will be apparent therefore that Pacific Coast producers will do well to keep their eyes on Japan. High prices for low grade pulp cannot be secured as there is



Typical Japanese street scene in the theater district

## Hardy S. Ferguson & Co.

*Consulting Engineers*

200 Fifth Avenue, NEW YORK CITY

Hardy S. Ferguson ..... Member A.S.C.E., A.S.M.E., E.I.C.  
Moses H. Teaze ..... Member A.S.M.E., E.I.C.  
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Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

**Pulp and Paper Mills and other Industrial Plants.**

**Steam and Hydro-Electric Power Plants  
Dams and other Hydraulic Structures**

the local production to be contended with but for a high grade there is no reason why American pulp should not compete successfully with the Scandinavian product.

Imports from Scandinavia have been decreasing every year and hitherto this decline has been met with increased shipments from Canada. The Pacific Coast of America is, however, forging ahead in shipments to Japan and reference to the import figures previously quoted will show that shipments in 1929 were double those of 1928 and this at the expense of Canada.

There is no reason why this expansion should not continue to take place providing the tariff rate is not increased and this latter does not seem likely to be effected in the near future.

Keep your mind on Japan, on conditions in China, and on the manufacture of a good rayon pulp for export and you will capture the main part of the Orient's requirements.



# 27 BINGHAM PUMPS

for

## PUGET SOUND PULP and TIMBER CO.

**PUGET SOUND PULP & TIMBER CO.**  
EXECUTIVE OFFICES  
EVERETT, WASHINGTON

Feb. 6, 1930

Bingham Pump Company,  
Portland, Oregon

Gentlemen:

We are enclosing herewith our order for twenty-six paper mill pumps for our new pulp mill. Please forward immediately dimension prints on all pumps to our engineers, Hardy S. Ferguson & Company, New York City.

With the approval of our engineers we have selected your pumps for a large portion of our new mill. This in line with our policy to favor Pacific Coast products whenever possible, thus minimizing the amount of invested capital in spare parts, and giving us a direct factory service which is always invaluable.

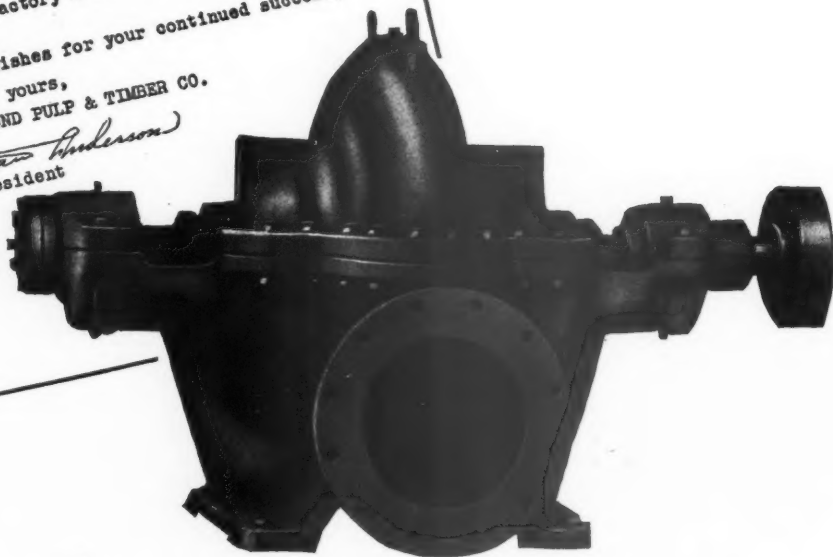
With best wishes for your continued success,  
we are Very truly yours,

PUGET SOUND PULP & TIMBER CO.

*Cassius Anderson*  
President

OA:REL

▼  
BINGHAM PUMPS ARE  
PACIFIC COAST MADE  
▲



## BINGHAM PUMP COMPANY

General Office and Factory:  
East Seventh at Main Street

PORTLAND

OREGON

When writing BINGHAM PUMP CO., please mention PACIFIC PULP AND PAPER INDUSTRY

**Paper Box Makers**

(Continued from page 113)

With regard to mergers that might take place in the paper industry in the vicinity of San Francisco, the general opinion seems to be that there will be some developments within the year, although it is too early to state what they will be.

Business problems that will have to be met by the industry as a whole are many, although the most important seems to be over-production.

"The problem of over-production in the paper box industry comes back to the factor of economy of production," says Hugh Peat, secretary of the Pacific Coast Paper Box Association. "Machines which were good two or three years ago are scrapped today. This over-production is, I think, forced on the Western paper box manufacturers by the competition of invading Easterners, which is becoming stronger each year. The large Western paper box manufacturers must seek their markets in the Middle West and in the East, for there must be an outlet found for the over-production found in the saturated markets of the West."

That the solution of over-production lies in the discovery and development of new markets where the paper box has never been used before, is the opinion of Mr. Platt, who says, "We have developed a market for paper boxes with the cigar manufacturers, who are beginning to use paper boxes in preference to wood. Also, fruit is being packed in paper boxes, where before some other kind of container was used."

As Carl Schmidt, Schmidt Lithographing Co., San Francisco, sees it, one of the biggest problems faced by the manufacturer is to develop a market for the

individual container. Mr. Schmidt says, "We must break down the large container into smaller units to get a chance for the paper box."

"To my mind the principal fault to be found with business conditions in 1929 was over-production. I think that the solution to this will be found in creating more business; in finding new markets for the paper box. The function of the paper box industry is to develop products for the staple food lines, as our industry is basic."

That the modernistic trend of the times in architecture, art, and industry generally is reflected in the paper box industry was the opinion of practically all of the manufacturers of the San Francisco Bay region.

"People are demanding new shapes for their boxes, even the clothing stores are 'dolling up' their suit boxes," says Mr. Gruenberg.

The modernistic trend in color and design was also stressed by W. J. O'Donnell, of the Fleischacker Paper Box Co., San Francisco. "Bright colors with startling designs in new types of papers were a feature of 1929," says Mr. O'Donnell.

Of this opinion also, is Mr. Platt. "Modernistic designs play a large part in the boxes manufactured by the United Paper Box Co. Whether this is a permanent innovation, or merely a passing fad of the public, remains to be seen."

All of these manufacturers were optimistic for 1930. The opinion seemed to be that the general demand for paper boxes is increasing rather than decreasing on the Pacific Coast, although over-production would have to be closely watched by all manufacturers.

# Industrial Chemicals

# SALT CAKE



**WILSON & GEO. MEYER & CO.**

*Shipping Merchants*

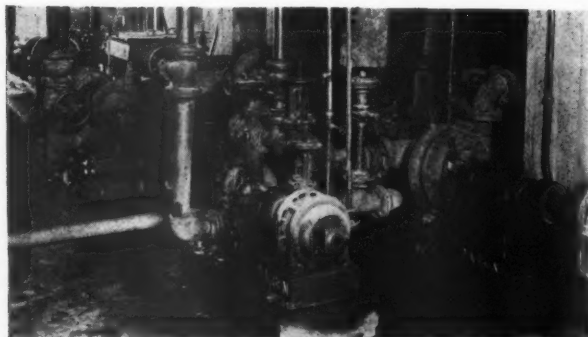
**Federal Reserve Bank Building  
San Francisco**

# Warren Pumps for paper mills

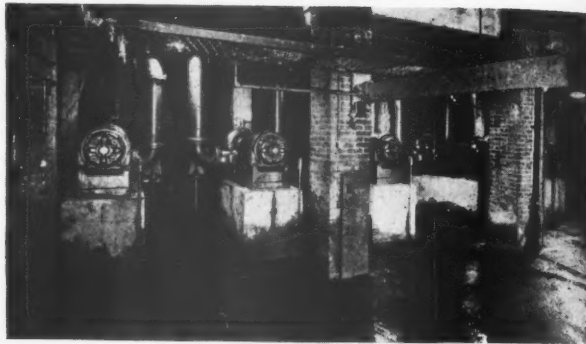


This Warren stuff pump in an eastern mill fills a 1400-lb. beater with 5% stock in 1 minute 20 seconds.

Warren stuff pumps will move 6% clean stock smoothly, efficiently and without clogging.

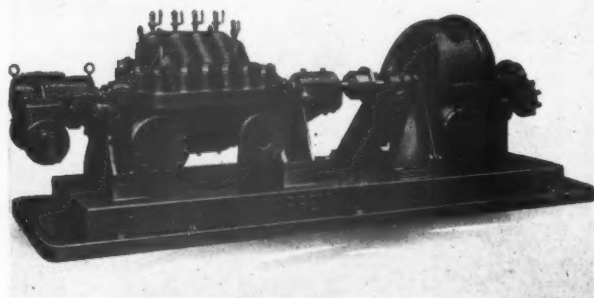


A battery of six 4" and 5" liquor and clear water pumps in a new southern paper mill.



5 of a group of 8 Warren white water pumps installed at Bird & Sons, Inc.

69% repeat orders from pulp and paper mills in 6 years . . . proof that Warren Pumps are built to live up to the claims made for them.



A Warren 4" five stage centrifugal boiler feed pump for feeding boilers against 500 lbs. working water pressure. Installed at Southern Advance Bag and Paper Co.

A Warren quotation is a guarantee that the pumps will do the work claimed, to the customer's satisfaction . . . Warren pumps are designed and built by engineers thoroughly familiar with pulp and paper mill conditions. Bulletins or estimates?

**Warren**  
**Steam Pump Company Inc.**  **Warren**  
**Massachusetts**

Agencies in all principal cities.



Photo by Pilot Bob Martin, Port Angeles Air Transport Co.

## KUPPLERS' EXPERIENCE IS NOW APPLIED TO BUILDING THE OLYMPIC FOREST PRODUCTS MILL

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Port Angeles, Wash.  
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GRAYS HARBOR PULP & PAPER CO.  
Both Units—Hoquiam, Wash.  
NATIONAL PAPER PRODUCTS CO.  
Second Unit—Port Townsend, Wash.

CHRIS KUPPLER'S SONS by reason of the valuable experience gained in the building of these outstanding mills are peculiarly well fitted to efficiently handle pulp and paper mill construction in the Pacific Northwest and Alaska in which the actual experience by the contractor counts so much toward the successful operation of the plant.

O. A. KUPPLER  
W. R. KUPPLER

G. W. KUPPLER  
H. B. KUPPLER

# CHRIS KUPPLER'S SONS

## SPECIALIZING IN PULP & PAPER MILL CONSTRUCTION

GENERAL BUILDING CONTRACTORS

Established 1889

General Offices: PORT ANGELES, WASH.



# As a Plane Would See



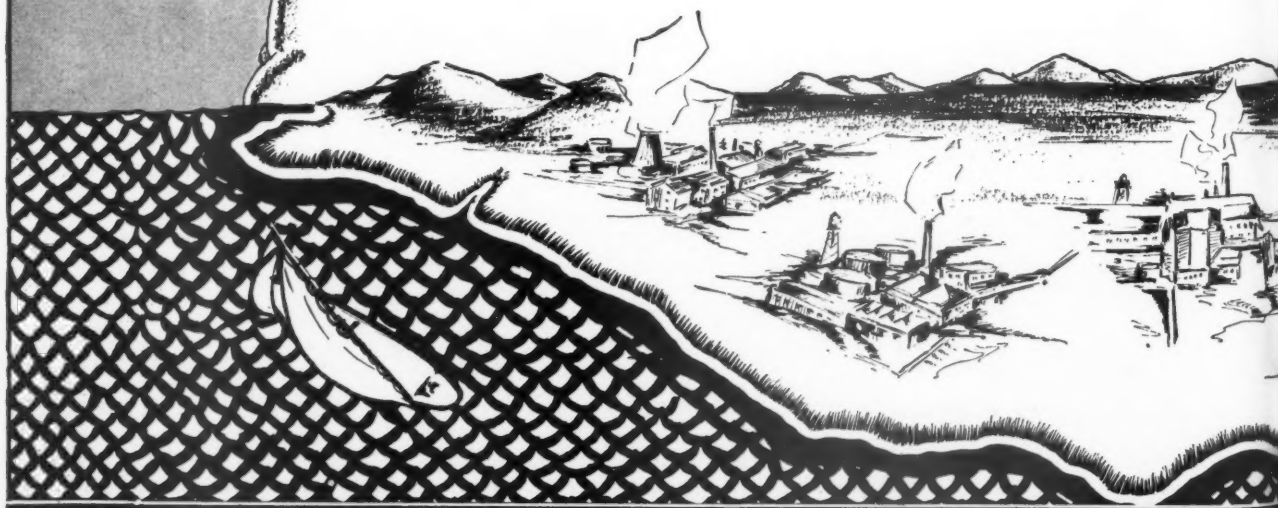
## *Paper Mills West of the Sierras Equipped with Oliver United Paper Mill Units*

Crown Willamette Paper Company  
(several plants)

Grays Harbor Pulp & Paper Co.  
Fibreboard Products Company, Inc.  
(several plants)

Washington Pulp & Paper Company  
National Paper Products Company  
Ranier Pulp & Paper Company  
Union Bag & Paper Power Corp.  
Hawley Pulp & Paper Company  
Pacific Mills, Inc.

Powell River Paper Company  
St. Helens Pulp & Paper Company  
Columbia River Paper Mills  
Everett Pulp & Paper Company  
Spalding Pulp & Paper Company



W  
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In sh  
oper  
uct. O  
Oliver

JOHANNES  
TOKYO  
America  
MILBOURN  
HONOLULU  
MANILA  
The  
SAN  
Federal

# See Them . . . .

**W**INGING its way down this great paper mill country, southward from British Columbia, a plane would pass over or within eye-shot of many a mill equipped with Oliver United units.

In each plant is one or more of the following types:

|               |                         |
|---------------|-------------------------|
| Save-Alls     | High Density Thickeners |
| Deckers       | Bleach Washers          |
| Kraft Washers | Lime Mud Filters        |

The mills using these machines operate with several distinct advantages. They have negligible fibre losses; more uniform and full capacity deckering; more thoroughly washed stock; more suitable stock for bleaching; higher recovery of chemicals; and lower evaporation costs.

In short, these Oliver United equipped mills are operating at less cost and turning out a better product. Other paper mills could to their advantage use Oliver United equipment.

## OLIVER UNITED FILTERS INC.



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MELBOURNE Fyvie and Stewart  
HONOLULU W. A. Ramsey Co.  
MANILA The Edward J. Nell Co.

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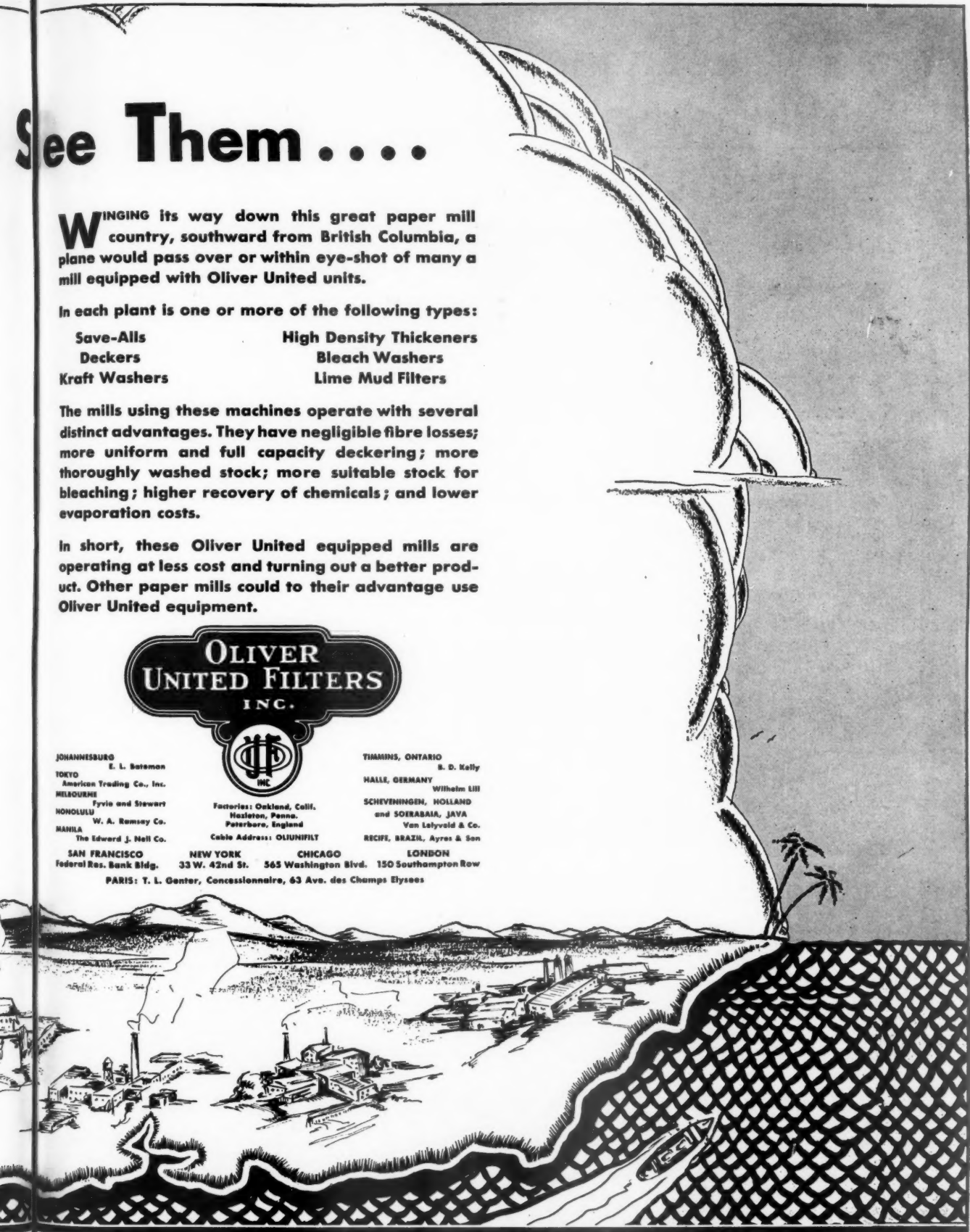
CHICAGO 565 Washington Blvd.

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PARIS: T. L. Genter, Concessionnaire, 63 Ave. des Champs Elysees

Factories: Oakland, Calif.  
Hazleton, Penna.  
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and SOERABAJA, JAVA Van Lelyveld & Co.  
RECIFE, BRAZIL, Ayres & Son



# Management should give more attention to...



## Handling

Paper companies are credited with pioneering the use of skids for shipments of their product and were among the first to capitalize on the economies made possible by the electric truck-skid system of handling.

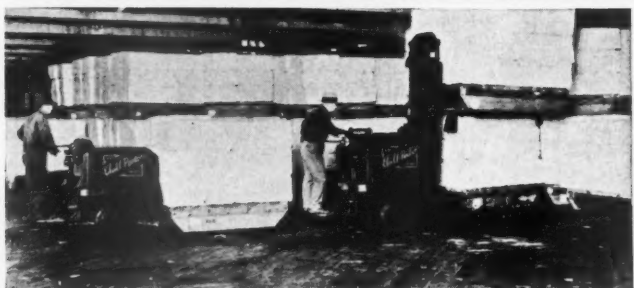
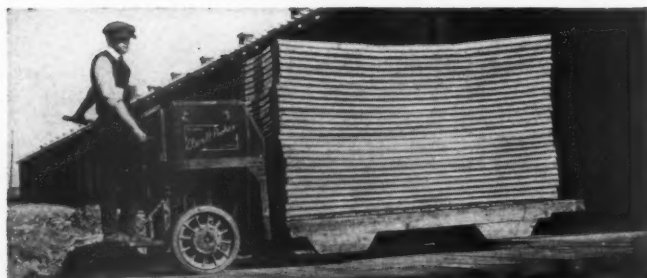
Yet many mills have failed to adopt this same cost saving system outside the shipping room where equally advantageous savings can be made.

The Elwell-Parker *Newsprint Tractor* for example handles barrels, bales, and other cylindrical loads just as easily as roll paper on end or side.

There is a *Hi-Lo Tractor*, too, for handling *double skid* loads of flat stock, cartons, pulp and cases. It is low enough to enter a freight car yet high enough to tier three tons with safety or place load on car floor from track level or onto motor truck.

With the *Lift Tractor* five tons of wall board, plaster board or heavy sheets can be picked up in 12 seconds and carried from 250 to 375 feet per minute. It is ideal for transporting bales of scrap stock to the beaters. And the lifting of heavy rolls, crates and boxes is child's play for the Elwell-Parker *Crane Tractor*.

All these E-P Tractor types are especially suitable for use in your mill. Why not ask an Elwell-Parker Engineer to make a survey of your plant? He will recommend the type best suited for your requirements if improvements in your present system can be made. The survey costs you nothing and does not obligate you in any way. *Those in your plant interested in more economical material handling are invited to write for complete information on E-P Tractors.*



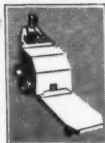
On an Elwell-Parker Tractor, the power can be applied to the wheels before brake is released. A fully loaded Tractor can thus be stopped and started on a ramp without danger of slipping back. Your safety committee will appreciate the importance of this advantage.

## The Elwell-Parker Electric Co.

Designers and Builders

SAN FRANCISCO  
Ira G. Perlin, 200 Davis Street  
Telephone Sutter 1476

SEATTLE  
Colby Steel & Engineering Co.  
456 Central Bldg., Tel. Elliot 5722



of Electric Industrial Trucks, Tractors and Cranes for 24 years

Cleveland, Ohio

## Tractors

SHIP ON SKIDS

When writing ELWELL-PARKER ELECTRIC CO., please mention PACIFIC PULP AND PAPER INDUSTRY



**Handicap**

(Continued from page 119)

in the evacuating system so as to get better drying from a given number of dryers and thus permit higher speed. Today the modern dryer sections roll easily in anti-friction bearings. The old cumbersome gears are disappearing to be replaced by small modern quiet gears or chain drive. Great effort is made to have the dryers in perfect balance and this feature of course applies also to other parts of the machine.

As for the winders the newer types are being built without any bottom slitter shafts. Small motors are applied with the slitter on the journals of the motor. Winders automatically remove the rolls when they are finished.

There seems to be general agreement that the 300-inch machine is the practical limit of width for a long time to come. While there has been only one installation of this width to date, satisfactory operation is reported. Any further increase would have to be a full roll wider to be really worth while. Further, these tremendously wide machines place new requirements upon the manufacturers of clothing equipment. It is also true that when a big machine has a break of any kind, the production losses are exceedingly heavy as compared to the smaller units. There are still many who believe that the 234-inch machine is the practical limit of width at the present date. They point out that it took a great many years to get the 234-inch machines to the point where they would operate satisfactorily. Each increase in width brings up new problems which must be solved and brings up that sage bit of advice to "make haste slowly".

It is also true that the wide machine may not be

adapted to every purpose. Where volume production on a standard grade is the chief requirement the wide machine is perhaps the answer, as for example on news and common board. But for other papers, where orders do not run in large quantities, the extremely wide machine of from 250 to 300 inches may not be adaptable. Machines of from 150 to 200 inches in width are no doubt here to stay, but there will probably still be room for small specialty machines capable of making a well formed high speed sheet. It is probable, therefore, that in view of the modernization, it will no longer be possible always to adapt old machines to new products and the only alternative will be the rebuilding of those machines, where conditions make it practical and the throwing out on the scrap pile of all others.

The net of all these improvements is a desire on the part of the paper manufacturer to produce more and better paper at lower cost. This accomplishment means better machinery. It means machinery that is equipped where possible with automatic facilities for handling the sheet. It means a machine which is balanced so that the wet end and the dryer section and the drive units each in turn is equipped to meet the maximum requirements of the other. The mention of balance brings to mind the actual dynamic balance of the revolving parts. Machine builders have gone to great expense to equip their shops with machines that guarantee parts to be in running as well as static balance.

The course of improvement which the immediate future seems to indicate lies along the line of refinements. Machine builders are today holding to accuracies of workmanship which a decade ago would have been scoffed at. These have affected the cost of high speed machines more than the average mill owner

# V. D. SIMONS, Inc.

## *Industrial Engineers*

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Pulp and Paper Mills, Hydro-Electric and  
Steam Power Plants, Electrification  
Paper Mill Properties

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TRIBUNE TOWER, CHICAGO, ILL.



# CASCADE PAPER COMPANY

*General Offices and Mill*  
West Tacoma, Washington



*Makers of*  
**Better Printing and  
Writing Papers**

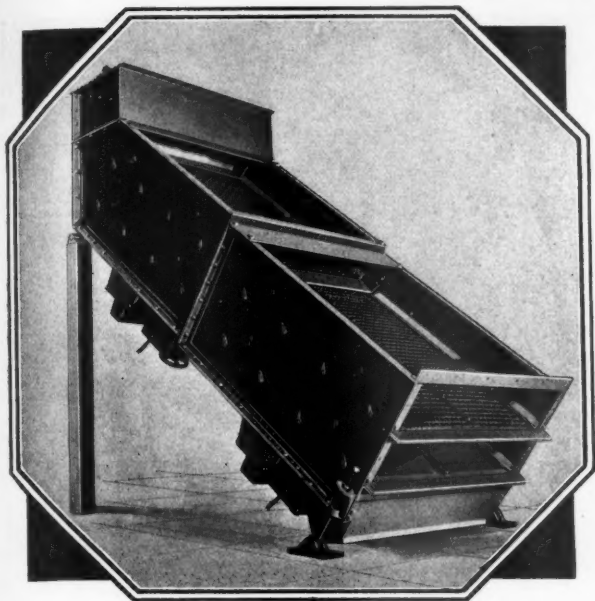
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## Hum-mer Electric CHIP SCREEN

Immense capacity!  
Thorough removal of sawdust  
and fine particles!  
Small floor space required!  
Low power consumption!  
Fully adjustable screening angle  
and vibration!  
No lubrication!  
No destructive shaking of supports  
or buildings!  
No belts or pulleys!  
Trouble-free operation!

These are the features which make the Wood Chip Hum-mer a profitable investment for pulp and paper mills!

Write for Catalogue 54-P

**The W. S. Tyler Company**  
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**TYLER**  
FOURDRINIER  
CYLINDER  
CORDUROY  
**WIRES**

deems consistent. Where a machine includes 100 per cent anti-friction bearings, gears that will run smoothly and quietly at high speeds, one or more expensive suction rolls, dynamic balancing of all revolving parts, and endless other improvements, such as adjustable lip slice, automatic oscillating suction boxes, convenience of handling the sheet thru the machine and the finished rolls from the winder, the cost of building a machine is increased tremendously. This cannot be offset to the same extent that it is in the automotive field by volume production, although much has been done in the way of special tools to meet these changing conditions.

One of the greatest difficulties facing the machine builders today is that most paper mill organizations do not fully appreciate how essential these refinements are. They either hesitate or refuse to pay the necessary first cost with the result that they pay more in the end. Curiously, a dollar seems to look much bigger when tacked on the first cost than it does on mill expense when the machine is in operation and the operators see the need of the improvements that should have been a part of the initial construction.

These are all very interesting conditions peculiar to the present rapid developments in paper making, and it undoubtedly will take some little time for all concerned to understand them fully.

### Paper Trade

(Continued from page 111)

ed first. Perhaps too many have tried to float their full capacities on the Coast market. This hasn't helped the jobbers any. But there is renewed hope as Coast mills are steadily moving greater paper tonnage to Mid-West, Gulf and Eastern markets.

H. L. ZELLERBACH

President

Zellerbach Paper Co.



That there is growing need for understanding between the Pacific Coast mills and the Coast jobbers was evident with the formation of a preliminary meeting at the 1929 Del Monte convention of the Pacific States Paper Trade Association of a mill relations group. The fundamental idea behind the group is to work out relations between jobber and mill and to obviate going through the same fundamental and unpleasant adjustments experienced by older parts of the country earlier in the present century.

## T.A.P.P.I.

(Continued from page 105)

Sigurd Norman, Spaulding Pulp & Paper Co., Newberg, Oregon; E. P. Ketchum, Powell River Co., Ltd.; and Myron Black, Inland Empire Paper Co., Millwood, Wash.

Secretary H. K. Benson attended the annual meeting in New York on February 20, 1930, as official representative of the Pacific Section. At this meeting the proposed changes in the articles of organization



RALPH REID

Vice Chairman  
Pacific Section  
T.A.P.P.I.

were read and formally approved. Final action, however, will be taken at the fall meeting of the national body. In accordance with these changes:

The officers of the Pacific Section shall consist of a chairman, and secretary-treasurer and such others as may be necessary, all of whom shall be active, associate, or junior members of the Technical Association. The section may adopt, subject to the approval of the Executive Committee, such by-laws as it may find expedient including the qualifications for affiliated members of the section.

An amount of money which shall not exceed 10% of the membership dues of the Technical Association members of the section may be refunded to the Section. These funds shall be used only to defray the office operating expenses and the expenditure must be audited and report submitted to the Executive Committee.

The membership of the Pacific Section will consist of active, associate or junior members of the TAPPI residing in the states and provinces bordering on the Pacific Ocean and of affiliated members elected by the section.

An affiliated member is any person interested in pulp and paper manufacture or in industries or institutions related thereto but who is not a member of TAPPI, and is elected by the section. Persons qualified for the various grades of members will continue to make application to the national officers of the Association. The grade of affiliated members will not be established until after the fall meeting of the TAPPI, and the qualifications and privileges of such members will be defined by the Pacific Section during the next year.

## The HOTEL CONGRESS

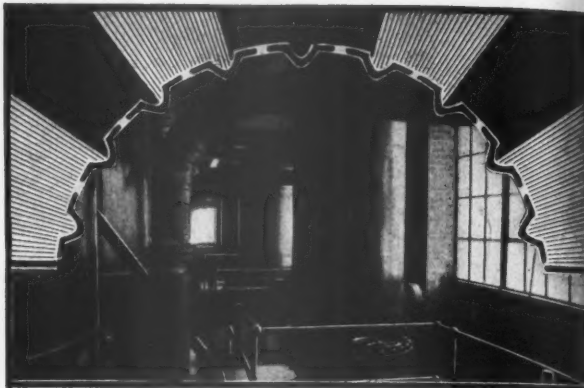
The stopping place in Portland  
for Pulp and Paper Men.



Sixth at Main  
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200 Rooms—200 Baths  
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Location.  
Reasonable Rates Prevail.

LOUIS E. BOGEL, Resident Manager



## MORTERUD SYSTEM

in the

### Union Bag and Paper Mills

**D**URABLE, dependable, economical—the Morterud System of indirect heating with positive circulation reduces waste and increases efficiency.

Steam is not put directly into the digester, but circulates through a series of seamless steel pipes. Therefore *no dilution*—black liquor actually increases in density and capacity of the recovery plant is stepped up. Pressure is brought up rapidly, followed closely by temperature: Liquor is forced through the heater and spread uniformly through the digester every ten or fifteen minutes. *Uniformity*. No over-cooking—no undercooking.

This produces bigger yield from the wood—a stronger, better quality pulp—and reduces quantity of chemicals used. As cooking time is reduced, the capacity is increased. Undiluted, the steam condensate is pumped directly back to the boilers—another big economy.

Savings effected by the use of this system pay for the installation in an astonishingly short time. Its advantages are so great that the initial cost is hardly a consideration.

### Slab Barking With U-BAR Drums in the Union Bag and Paper Company

Slab barking in the Union Bag and Paper Company with U-BAR Drums is a very real success. And no matter how strict the requirements are for CLEAN pulp, the U-BAR Slab Barking method meets them.

Built to fit the job—Big Production results from the special design and its continuation is insured by rugged dependable construction. The specially designed U-BARS of high carbon steel are securely riveted to heavy ship channel rings—thus effective, clean barking.

Smooth rotation is the result of chain suspension with guide rolls, sprockets and spring take-ups or shock absorbers—hence faster rotation and BIG PRODUCTION.

### The Giant Nekoosa Bark Press

Handles refuse bark from the U-BAR Drums. Reduces water in bark to 55%—almost natural water content. Turns bark disposal problem into a steam generating asset. Strong, rugged construction. Simple operation. A machine of far-reaching economy, as all users enthusiastically testify.

Full Details Sent on Request

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